THE RUBBER AGE

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May 10th
1917

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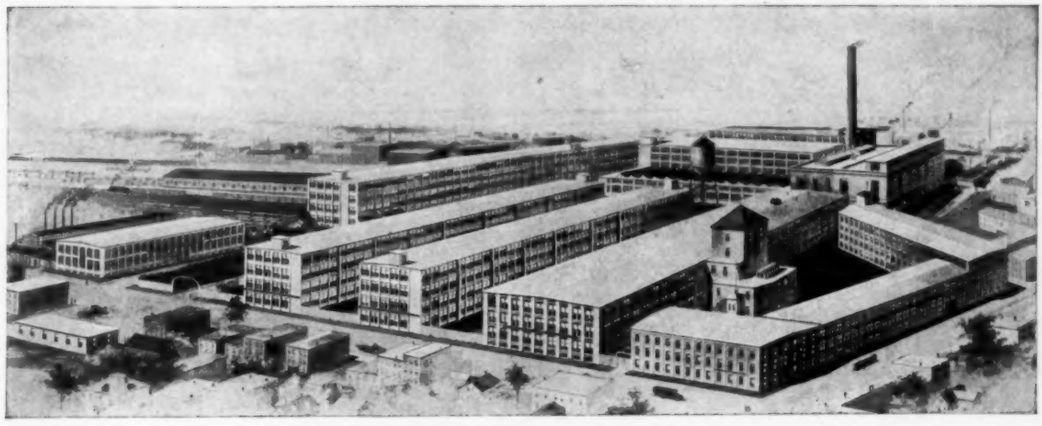

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THE RUBBER AGE

MAY 10, 1917 VOL. I. NO. 4

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THE GARDNER, MOFFAT COMPANY, Inc., *Publishers*
120 WEST 32D STREET NEW YORK

SUBSCRIPTION PRICE: ONE DOLLAR PER YEAR. SINGLE COPIES TEN CENTS. CANADA: TWO DOLLARS A YEAR. FOREIGN: THREE DOLLARS A YEAR.

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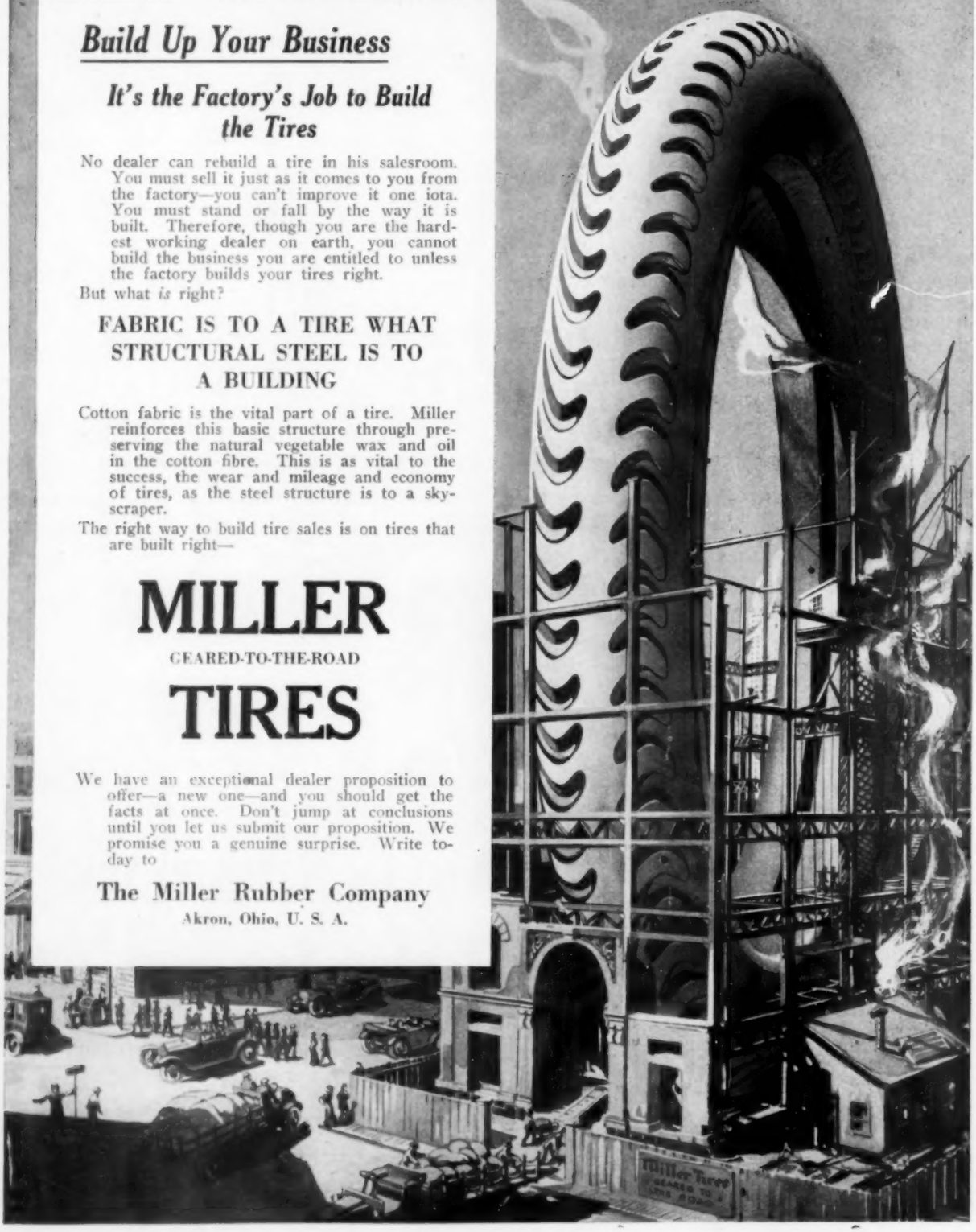


THE RUBBER AGE

How Rubber Is Prepared for Tire Making

Few tire distributors and dealers are familiar with the interesting processes through which rubber and fabrics pass before they emerge as a completed tire. As general knowledge of the methods of manufacture often proves of assistance in buying and selling, the following description has been prepared with a view of telling how rubber is prepared for tire-making, the illustrations being reproduced from photographs taken by THE RUBBER AGE in the new factory of the Gryphon Rubber & Tire Co. in the Kingsbridge section of the Bronx, New York City.

Crude Rubber

The crude rubber as it enters the factory is stored in bins, such as are illustrated in Fig. 1. The bins here shown contain plantation rubber, as will be recognized by the fact that it is in the form of sheets. Other bins, not shown, hold the Para rubber, which is received in balls that vary in size from that of a small pumpkin to a prize squash.

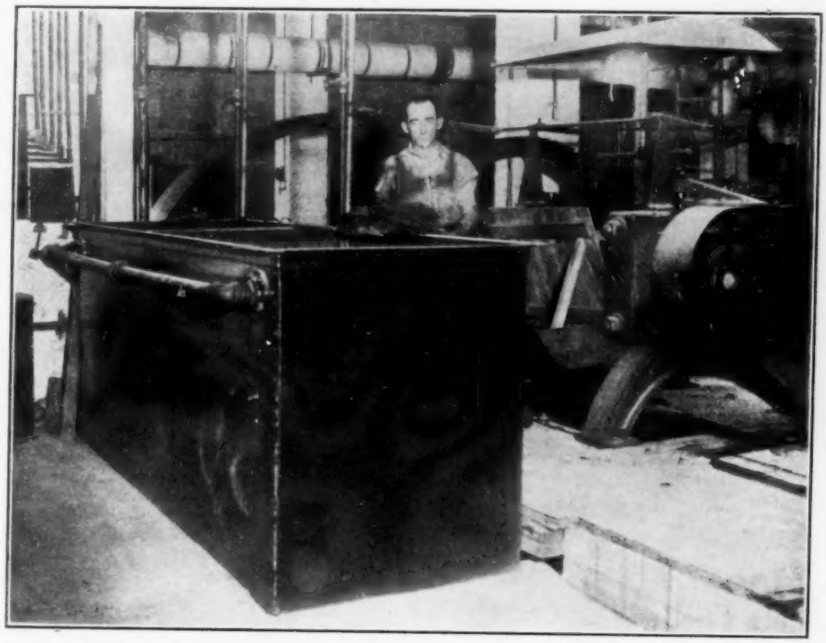


FIG. 2—REMOVING RUBBER FROM "PICKLING" TANK TO PLACE IT IN WASHING MILL

In this factory, where hand-made tires are manufactured and where quality is given careful attention, Para and plantation smoked sheets are used in the inner tubes and the casing walls, and Caucho ball and plantation crepe are used for treads and frictioning. The crepe and Caucho are also dissolved for cements.

Washing Crude Rubber

The first process crude rubber goes

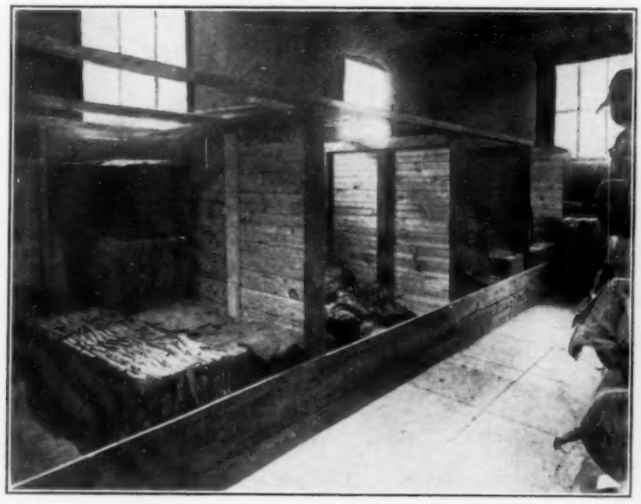


FIG. 1—BINS IN CRUDE RUBBER STORAGE ROOM

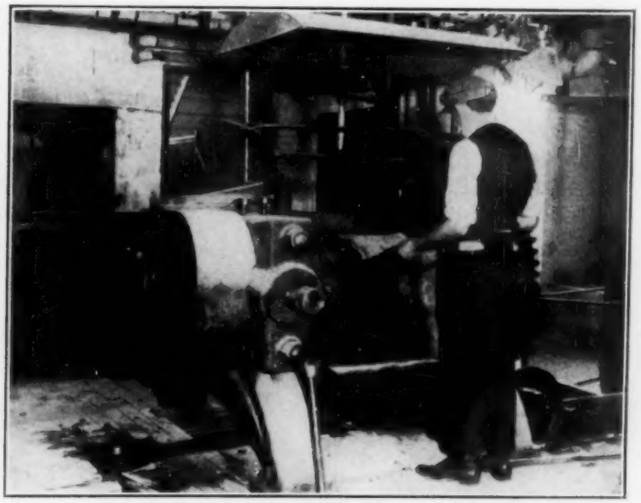


FIG. 3—WASHING MILL BEING USED TO SHEET WASHED RUBBER

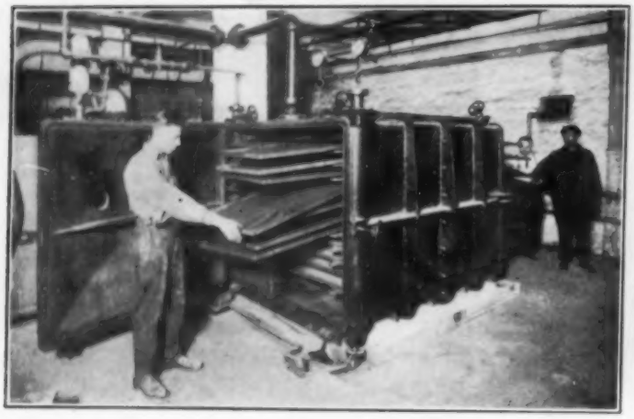


FIG. 4—REMOVING WASHED AND DRIED CRUDE RUBBER FROM VACUUM DRIER

FIG. 6—COMPOUNDING ROOM, WEIGHING A BATCH OF RUBBER

through is a thorough washing in order to remove impurities. The rubber is soaked in hot water in an iron "pickling" tank, shown in Fig. 2, in order to soften it. After some hours of "pickling" the large pieces are sliced up with knives or powerful shears.

Next comes the washing process proper. The washing mill shown in Fig. 3 is a heavily built machine, consisting essentially of two iron horizontal rollers, at least one of which is grooved. The rollers revolve inwardly at different speeds, their distance apart being regulated by screws on the front part of the mill-frame.

In the actual washing process the workman places by hand small quantities of rubber between the rollers, on which a stream of water is kept constantly running during the washing operation. The gripping action of the rollers tears the rubber into pieces, while the water removes the impurities. After passing several times between the rollers the cleansed rubber takes the form of a rough sheet.

The bar visible over the rolls is connected with an endless screw on the transmission shaft, and the slightest pressure on this bar by the workman will throw out the clutch and stop the mill. Thus, if the workman should get his hand caught between the rolls his other hand or his head would be sure to strike the safety bar and stop the mill.

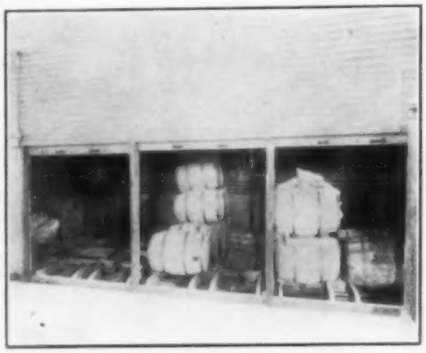


FIG. 5—BARRELS OF COMPOUNDING INGREDIENTS DRYING IN STEAM-HEATED DRY ROOM

Drying the Washed Rubber

The rubber as it comes from the washing mills has to be entirely freed of water. This is frequently done by placing it in a vacuum drier, such as is illustrated in Fig. 4. Drying by vacuum and heat is rapid and efficient, as it requires much less space and time than the old drying-room system and has the additional advantage of preventing superficial oxidation of the rubber, such as takes place during air drying at high temperatures. For the subsequent processes of manufacture it is of utmost importance that the rubber be "bone dry."

Dry Room for Compounding Ingredients

Compounding ingredients that are to be combined with the rubber, such as sulphur, litharge, whiting, etc., are required to be free of moisture when weighed and mixed. To eliminate any dampness the containers of these ingredients are stored in a special room provided with steam coils to maintain a constant temperature. The arrangement of a good example of a dry room is shown in Fig. 5.

Compounding Room

The compounding room, shown in Fig. 6, is always considered the most secret part of a rubber factory, for it

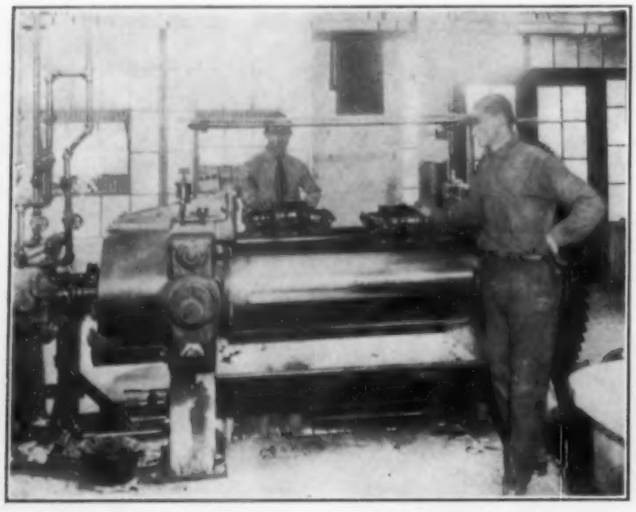


FIG. 7—REMOVING RUBBER FROM MIXING MILL

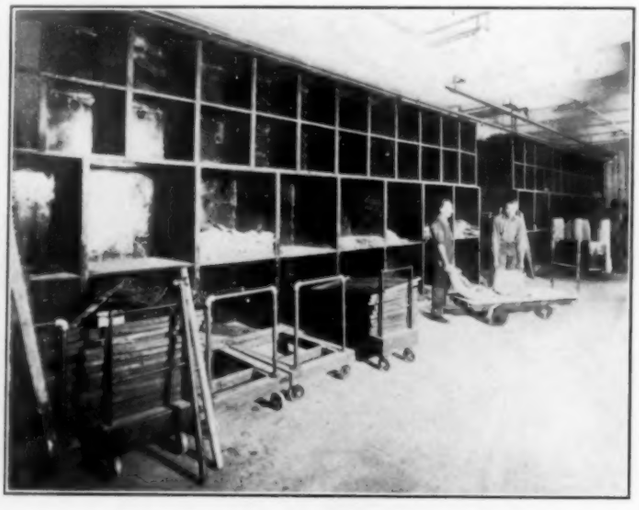


FIG. 8—COMPOUNDED RUBBER STORED IN BINS

is here that the various ingredients that give special desirable qualities to the rubber are carefully weighed out according to secret formulas.

Rubber lends itself with great facility to admixture with a variety of substances, both organic and inorganic, which can be worked into it in a powder form.

In this connection it may be mentioned that there is often an expressed wish on the part of tire users that they be told that they are getting "pure Para tires," that is to say, pure crude rubber with the strictly necessary addition of sulphur. Formerly, and even today, this assurance is frequently given, but as a matter of fact "pure Para" would be almost useless. It is by combining some of the various qualities of compounding ingredients that rubber acquires the quality necessary to stand the wear and tear of service on automobile wheels.

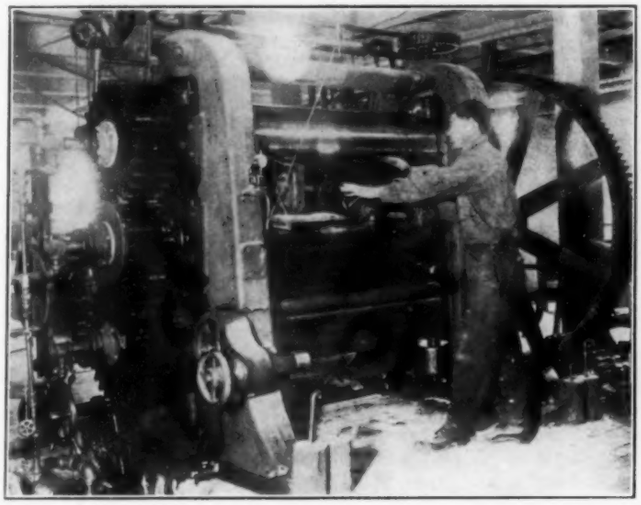


FIG. 9—FEEDING RUBBER STOCK INTO A CALENDER

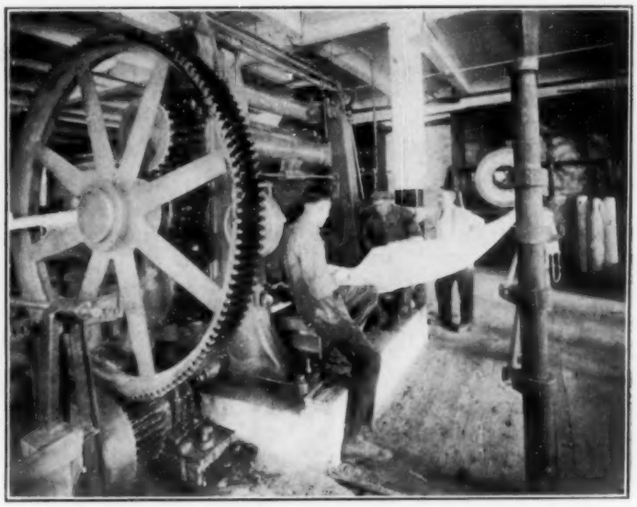


FIG. 10—FRICTIONING TIRE FABRIC

Mixing

The rubber and various chemicals, including sulphur, after being carefully weighed out in the compounding room, have to be worked into a uniform mass. This is done on mixing mills, which are similar in general appearance to the washing mill. With the help of Fig. 7 the character of the mixing mill will be readily understood. There are two large steel rolls, the surfaces of which are smooth. These rolls are geared to move in opposite directions and at slightly different speeds. They are hollow, so as to allow steam or cold water to be circulated in them to keep them at the desired temperature for suitably working the rubber mass.

In mixing a batch of compound the workman places the rubber on the rolls, which are slightly separated, and after a time it is formed into a sheet, which adheres to the slower-moving front roll; the various powders are then gradually sprinkled on to the rubber and become incorporated with it. From time to time the workman slits the rubber sheet through with a knife, putting the several pieces between the rolls to again be formed into a sheet. By repetitions of this process a perfectly homogeneous mass is obtained .

After mixing, the compounded rubber is dusted with talc and put to cool on cooling tables, the tops of which are of coarse wire netting. When thoroughly cooled it is stored until needed in horizontal bins, shown in Fig. 8.

Breaking Down

The operation known as "breaking down" or "warming up" has for its object the restoration of plasticity to washed or compounded rubber which has become rigid.

This operation does not call for special description. It consists of running the rubber over and over again through the heated rolls of a mixing mill that is reserved for this work.

Calendering

When the stock is warmed up on the mill it is slit with a knife and, guided by the hands of the workman, it rolls itself into a smooth, very dense roll, such as shown in Fig. 7. To be able to use it in making tires or other rubber goods this mass is rolled out into sheets of such thickness as is required for the use to which it is to be put. This is done on a calender, which consists essentially of a system of heavy iron rolls. The rolls of calenders, like those of the mixing mill, are chambered to allow of the circulation of steam or cold water, as required. Their surface is perfectly smooth.

The method of operating, shown in Fig. 9, is briefly as follows: The workman passes the compounded rubber mass between the rollers. He places it in small pieces at a time between the top and the second roll of the calender. It at once forms a thin sheet, which adheres to the second roll and then, passing between this roll and the bottom one, it is rolled onto a sheet of fabric which is being continuously unwound from a wooden roller or box, visible in the photograph, Fig. 10. The rubber and the fabric are then wound on a core at the front of the calender, when it is ready for use in making tires. Before being taken from the calender and wrapped the rubber sheet is tested with a gage for accurate thickness. This gage is visible in the photograph Fig. 10.

The rolling up of the rubber sheet with fabric is necessary in order to prevent the layers of rubber from adhering to one another and becoming a solid mass.

Preparation of Fabrics

It must be borne in mind that the strength of a pneumatic tire depends largely upon the fabric of which its carcass is built, and which is the now most important and costly part of the whole tire. The fabrics used in making good automobile tires should be of the best qualities of long staple cotton. The tensile strength and the stretch of both weft and warp threads must be as nearly as possible equal.

The fabric is inspected and tested, and any imperfections in it cause its rejection. Special machinery is used for this work. It should also be mentioned that for frictioning fabric must be positively free from moisture. To accomplish this it is passed over rollers, back and forth, between the steam-chambered platens of a cell-

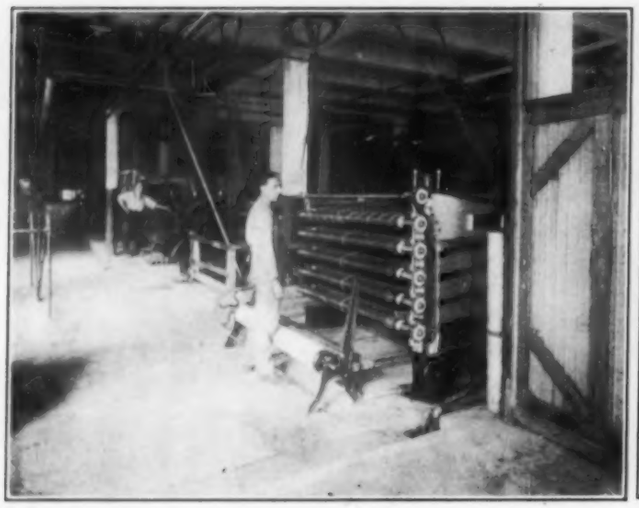


FIG. 11—CELL DRIER USED TO REMOVE MOISTURE FROM TIRE FABRIC

FIG. 12—BIAS CUTTING TABLE

drier, which is shown in Fig. 11. When thoroughly dry the fabric is placed in a closed, heated chamber called "hot box," where it is kept hot to prevent it from absorbing moisture. For frictioning fabric is run through the calender as hot as possible without deteriorating its fiber.

To make the fabric impervious to water and moisture it must be filled and coated with rubber. For this purpose it is taken to the calender and run through the steam-heated rolls together with the rubber. In this operation the roll next to the rubber is geared to revolve slightly faster than that carrying the fabric. This difference in roll speed creates a friction movement which, together with the pressure created by setting the rolls together, forces the rubber into the interstices of the web of the fabric, where its presence renders the fabric impervious to water and moisture. A rubber coating applied with calender rolls running at even speed insures a perfect contact and adhesion between the layers of fabric when these are built into the tire carcass.

The rubber stock used in this proofing operation is known as frictioning stock. It must be so compounded as not to overvulcanize nor become sticky under the strain of the heat and the pressure that is necessary to force it into the fabric.

The rubberized fabric as it comes from the calender is wrapped in sheeting and is taken to the cutting department, with its smooth zinc covered tables, to be cut into strips on the bias, as shown in photograph Fig. 12, or this work is done with a bias-cutting machine.

The fabric is now ready to be used in tire building, which will be described in a subsequent article.

Rubber Insulation—New Specifications and Methods of Analysis*

Part I—General Report

In recent years, there has been no difficulty in securing insulation having the dielectric strength, specific resistance, elasticity and mechanical strength required in practice. Indeed, with the possible exception of dielectric strength, these qualities are usually in excess of actual service requirements. There is another quality, namely, permanence, which although equally essential, has not been so easy to obtain.

While the physical properties of rubber insulation are susceptible of positive determination by tests which can be made before acceptance by the purchaser, the permanence of insulation can be ascertained with certainty only by actual trial, often at great loss, inconvenience and even danger. It should, therefore, be the aim of specifications to overcome this difficulty and by some indirect means, ensure that the manufacturers supply compounds having the required endurance.

This obviously presents a difficult problem, as it requires that some relation be established between permanence and one or more of the properties which are susceptible of test. It has been established by experience that Hevea rubber or the rubber of the *Hevea Brasiliensis* tree, when properly cured, is a superior grade which is entirely satisfactory for electrical insulation of the class under consideration. Hevea rubber may, therefore, be specified with advantage, although certain other rubbers of good quality may thereby be excluded. The rubber has to be Hevea rubber of good quality, the materials associated with it in the compound must be known to be non-deleterious, and the compound itself must be well prepared, applied and vulcanized.

The Joint Rubber Insulation Committee which since 1911 has been engaged in preparing specifications for rubber insulation has rendered the accompanying comprehensive report.

TYPES OF SPECIFICATIONS

Two types of specifications have been devised to compass these restrictions. The first type of specification proceeds on the assumption that certain physical characteristics are developed to an unusual degree by the use of Hevea rubber, especially the grade known as fine Para. Among the qualities affected by the grade of rubber, and alleged to be useful indications of the presence of Para rubber, are the tensile strength, elasticity, and specific electrical resistance. Accordingly, some specifications have been issued in which one or more of these qualities is specified in an exaggerated degree. Experience has shown that such specifications are ineffective, as the specified physical quality can be obtained either by manipulation of poor compounds or at the expense of permanence in compounds made originally of good materials. In consequence of this, specifications based exclusively on physical tests have fallen into disrepute, but such tests now serve in modified form as adjuncts to other types of specifications.

The second type of specification to be considered is that in which a more or less rigid formula for the compound is specified and compliance with it exacted either by inspection during manufacture or by chemical analysis supplemented by other tests of the finished product. Inspection which will really ensure compliance with such specifications is usually impracticable. Reliance must, therefore, be placed principally upon chemical analysis. Three difficulties at once arise. In the first place, chemical analysis cannot directly ascertain the quality of the rubber which has been used in the manufacture of a compound; it can only determine quality by the indirect method of measuring certain characteristic constituents. It is therefore necessary to present in the specification a relation between the desired formula and the

*Condensed from the Proceedings of the American Institute of Electrical Engineers.

chemical findings. The second difficulty is that in the past chemists have employed diverse methods of analysis which give inconsistent results. It is therefore necessary to establish a satisfactory and standard procedure for analysis. The method of analysis must not only yield the information desired, but it must also be practical and capable of yielding uniform results when applied to the same compound by different chemists. In order to secure this uniformity it is important to describe the methods of analysis in detail. The third difficulty has been the non-uniform interpretation of analytical results.

The specification hereinafter presented is of the second or chemical type, in which an endeavor has been made to meet the three objections hitherto urged against such specifications. It contains a table showing the range of analytical results that should be obtained from a good compound containing 30 per cent of high-class Hevea rubber, and is supplemented by a detailed analytical procedure. The specification is not complete as given, it being necessary to add appropriate electrical and mechanical test requirements. Examples of complete rubber insulation specifications are cited in Part VI. of this report.

The specification should always be used in conjunction with the analytical procedure. The latter will, however, serve for the analysis of any compounds of the 30 per cent Para type with mineral fillers, provided the interpretation is made to correspond.

Part II—Specification for 30 Per Cent Hevea Rubber Compound (Chemical Clauses)

A 30 per cent fine Para or best quality plantation Hevea rubber compound with mineral fillers shall be furnished. It shall contain only the following ingredients:

Rubber,
Sulphur,
Inorganic mineral matter,
Refined solid paraffine or ceresine.

The vulcanized compound shall conform to the following requirements when tested by the procedure of the Joint Rubber Insulation Committee, results being expressed as percentages by weight of the whole sample:

Requirements Independent of the Amount of Rubber Found

	Maximum.	Minimum.
Rubber	33	30
Waxy hydrocarbons	4	....
Free sulphur	0.7	....

Red lead, carbon, or organic fillers shall not be present.

Requirements Dependent Upon Amount of Rubber Found

(Requirements for intermediate percentages shall be in proportion to the percentage of rubber found.)

Limits allowed for 30 per cent Rubber Compound—	Maximum.	Minimum.
Saponifiable acetone extract	1.50	0.55
Unsaponifiable resins	0.45	....
Chloroform extract	0.90	....
Alcoholic potash extract	0.55	....
Total sulphur (see note 2)	2.10	....
Specific gravity	...	1.75
Limits allowed for 33 per cent Rubber Compound—		
Saponifiable acetone extract	1.50	0.60
Unsaponifiable resins	0.50	....
Chloroform extract	1.00	....
Alcoholic potash extract	0.60	....
Total sulphur (see note 2)	2.30	....
Specific gravity	...	1.67

The acetone solution shall not fluoresce.

The acetone extract (60 cu. cm.) shall be not darker than a light straw color.

Hydrocarbons shall be solid, waxy, and not darker than a light brown.

Chloroform extract (60 cu. cm.) shall not be darker than a straw color.

Failure to meet any requirement of this specification will be considered sufficient cause for rejection.

Contamination of the compound, such as by the use of impregnated tapes, will not excuse the manufacturer from conforming to this specification.

NOTE 1:—This specification shall be supplemented by appropriate clauses relating to tensile strength, elasticity, electric insulation resistance, and dielectric strength. (See the Wire and Cable specifications of the American Society for Testing Materials, the Association of Railway Electrical Engineers, etc., for examples of such clauses.)

NOTE 2:—The limit on total sulphur may be omitted at the option of the purchaser. See Part IV. of Report.

Part III—Analytical Procedure

The object of this procedure of analysis is to determine whether rubber compounds comply chemically with the accompanying specification, which is intended to secure compounds containing 30 per cent of the best Hevea rubber and mineral fillers.

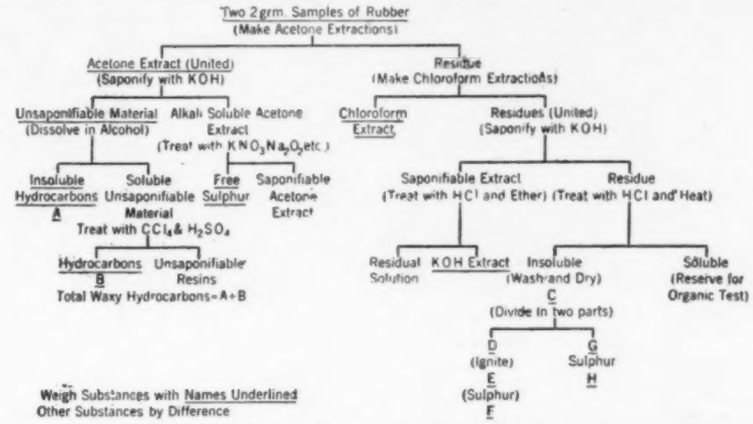


DIAGRAM A—OUTLINE OF METHOD OF RUBBER ANALYSIS EXCLUSIVE OF TOTAL SULPHUR DETERMINATION

The general procedure is shown by the accompanying Diagram *A*.

Make the analysis upon the insulation after vulcanization and, whenever possible, before the saturation of the braid. Wipe the insulation thoroughly with a damp cloth to remove any adhering material, but do not remove waxy hydrocarbons from the surface.

If, however, a saturated braided sample must be used, remove the braid and sandpaper the insulation to a depth of at least 0.005 of an inch and wipe with a damp cloth. The latter procedure, however, is not to be recommended, as it may cause an appreciable error in the acetone extract. In such cases report the condition of the sample.

Perform all determinations in duplicate and take the average value arbitrarily as the true value. Duplicate determinations must check within the limits specified.

Make blanks on all determinations and deduct the results accordingly.

Alcoholic potash solution shall be of normal strength and shall be made freshly by dissolving the proper amount of potassium hydrate (purified by alcohol) in 95 per cent alcohol which has previously been distilled over potassium hydrate. The solution shall be allowed to stand for 24 hrs. and only the clear liquid used.

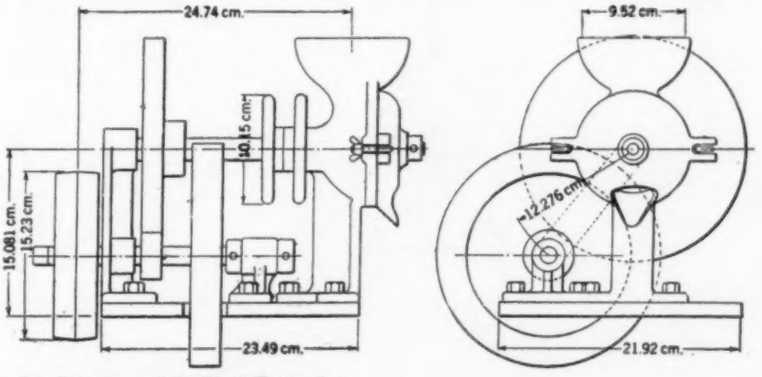
Ether shall be washed with three successive portions of distilled water and distilled, using the fraction 34-36 deg. C.

Chloroform shall be shaken with water, dried by calcium chloride, decanted, and freshly distilled, only the clear distillate being used.

Carbon tetrachloride shall be pure and freshly distilled.

The nitric acid bromine reagent shall be prepared by adding a considerable excess of bromine to the concentrated nitric acid, shaking thoroughly, and allowing it to stand for some hours before using.

The fusion mixture for sulphur determinations shall be made by mixing equal quantities



Grinding plates of the No. 0 Enterprise Coffee Mill to be used

DIAGRAM B—RUBBER GRINDER

SAMPLE

Remove the insulation entirely from sufficient wire to give a sample weighing about 25 grams. Cut this into small pieces* and grind slowly in either a No. 0 Enterprise coffee mill or a mill such as shown by the accompanying Diagram *B*. Adjust the grinder so that not more than 20 per cent will pass through a 40-mesh sieve. Sift all the material through a 20-mesh sieve, regrinding what is retained on the sieve until the entire sample has passed through. The wires of the sieves shall be evenly spaced in both directions and shall be of 0.016 and 0.010 inches diameter in the 20-mesh and 40-mesh sieves, respectively. Remove with a strong magnet any metal that may have come from the grinder and thoroughly mix the sample.

EXTRACTION APPARATUS

The extraction apparatus shall conform with the accompanying Diagram *C*. It shall be heated so that the period of filling an empty syphon cup with acetone and completely emptying it will be between two and one-half and three and one-half minutes.

PREPARATION OF REAGENTS

Acetone shall be freshly distilled over anhydrous potassium carbonate, using the fraction 56-57 deg. C.

*This is most conveniently done with a meat-chopper.

of sodium carbonate and powdered potassium nitrate.

The barium chloride solution shall be made by dissolving 100 g. of crystalized barium chloride in one liter of distilled water and adding two or three drops of concentrated hydrochloric acid. If there is any insoluble matter or cloudiness, the solution shall be heated on a steam bath over night and filtered through 589 S. and S. blue ribbon filter paper.

Distilled water only shall be used in preparing solutions and in all washing operations. Reagents not otherwise specified shall be of a "c.p. tested" quality.

ACETONE EXTRACT

Extract continuously with 60 cu. cm. acetone for eight hrs. two 2-gram samples that have been prepared with 24 hrs. Unite the extracts

in a weighed flask, using hot chloroform to rinse the flasks. Distill off the reagents and dry the flask and contents for 4 hrs. at 95-100 deg. C. Desiccate until cool and weigh. Continue to dry for 2-hr. periods until constant weight is obtained. In drying place the flask on its side, but at a sufficient angle from the horizontal so that the extract does not appreciably run down the side of the flask.

UNSAPONIFIABLE MATERIAL

Add to the acetone extract 50 cu. cm. alcoholic potash solution, boil under a reflux condenser for 2 hrs., and evaporate on a water bath until all alcohol is removed. Add 10 cu. cm. water and 20 cu. cm. ether; heat until the wax, etc., are in solution, cool, transfer to a separatory funnel, wash out the flask with warm water, cool, and finally wash with two 20 cu. cm. portions of ether. The water volume should be 100 cu. cm. and the ether at least 40 cu. cm. Shake vigorously for 2 min. and allow the solutions to separate thoroughly. Draw off the aqueous solution into a second funnel, leaving in the first funnel the ethereal solution and any flocculent material that may be present. Again rinse the flask with 20 cu. cm. ether and add it to the aqueous solution; shake vigorously for 2 min., and when separated draw off the aqueous solution and unite in the first funnel the ethereal solutions and any flocculent material. Repeat, shaking with 20 cu. cm. portions of ether until no residue is obtained on evaporating a 20 cu. cm. portion. The aqueous solution and subsequent washings shall be reserved for the free sulphur determination. Wash the flask and the funnel from which the ethereal solution has been taken with water until they are free from alkali. Wash the ethereal solution with water until it has been washed twice after the wash water shows no alkaline reaction. Retain with the ethereal solution any flocculent material. Filter the ethereal solution from the flocculent material through a small pellet of extracted cotton into a weighed flask, washing first with ether and subsequently with hot chloroform, using this to rinse the original flask and both separatory funnels. Evaporate the solvents and dry the extract at 95-100 deg. C.; cool in a desiccator and weigh. Continue to dry until constant weight is obtained.

HYDROCARBONS A

Add 50 cu. cm. absolute alcohol to the unsaponifiable material and warm until solution is as complete as possible. Cool the solution to —4 or —5 deg. C. and maintain at this temperature for 1 hr. by packing the flask in a mixture of ice and salt. Filter out the waxy hydrocarbons, using a funnel packed with ice and salt, and apply suction if necessary. Wash the flask and filter with about 25 cu. cm. of 95 per cent alcohol which has been previously cooled in the same temperature. Catch the filtrate in a flask which is afterwards cooled to —4 or —5 deg. C. to make sure that all possible waxy hydrocarbons have been removed, and refilter if necessary. Dissolve the residue on the filter paper with hot chloroform into the original flask. Evaporate the chloroform and dry the flask at 95-100 deg. C.; cool in a desiccator and weigh. Continue to dry until constant weight is obtained.

HYDROCARBONS B

Evaporate the alcohol from the flask containing the alcohol-soluble unsaponifiable material, add 25 cu. cm. of carbon tetrachloride, and transfer to a separatory funnel. Shake with concentrated sulphuric acid, drain off the discolored acid, and repeat with fresh portions of acid until there is no longer any discoloration. After drawing off all the acid wash the carbon tetrachloride solution with repeated portions of water until all traces of acid are removed. Transfer the carbon tetrachloride solution to a weighed flask; evaporate off the solvent and dry the flask at 95-100 deg. C.; cool in a desiccator and weigh. Continue to dry until constant weight is obtained.

FREE SULPHUR

Add 2 grams potassium nitrate to the aqueous solution and washings from the ethereal separation of the unsaponified material. Evaporate to dryness in a silver or nickel dish and heat to quiet fusion, avoiding contamination with sulphur fumes. Transfer with cold water to a beaker, neutralize with hydrochloric acid; add 2 cu. cm. concentrated hydrochloric acid; filter and wash, making a volume of 200 cu. cm. Heat to boiling and add slowly a slight excess of hot barium chloride solution. Allow to stand over night, filter, wash, ignite, weigh the barium sulphate, and calculate to sulphur.

DEFINITION OF TERMS DESCRIBING COMPONENTS OF ACETONE EXTRACT

The difference between the acetone extract and the free sulphur shall be called the Organic Extract.

The difference between the organic extract and the unsaponifiable material shall be called the Saponifiable Acetone Extract.

The sum of the hydrocarbons A and B shall be called the total Waxy Hydrocarbons.

The difference between the unsaponifiable material and the waxy hydrocarbons shall be called Unsaponifiable Resins.

CHLOROFORM EXTRACT

Extract continuously the residues from both of the acetone extractions (without necessarily removing the acetone that may be on them) for 4 hrs. with 60 cu. cm. chloroform. Unite the extractions in a weighed flask, using hot chloroform to rinse the flasks. Distill off the solvent and dry the flask and contents for 2 hrs. at 95-100 deg. C. Cool in a desiccator and weigh. Continue to dry for 1 hr. periods until constant weight is obtained. In drying place the flask on its side, but at a sufficient angle from the horizontal so that the extract does not appreciably run down the side of the flask. (If it is needful to wait after the acetone extraction before starting the chloroform extraction, the sample must be kept in a vacuum of at least 50 mm. of mercury.)

ALCOHOLIC POTASH EXTRACT

Dry the residues from the chloroform extractions at 50-60 deg. C. until the odor of chloroform can no longer be detected; unite the residues from the two 2-gram samples in

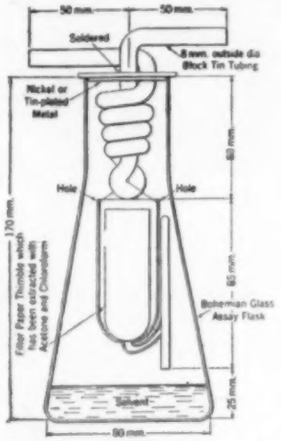


DIAGRAM C—RUBBER ANALYSIS EXTRACTION APPARATUS

a 200 cu. cm. Erlenmeyer flask. Add 100 cu. cm. alcoholic potash solution and boil for 4 hrs. under a reflux condenser. Filter the solution by decantation through an 11 cm. hardened filter paper into a beaker and wash twice, using each time 25 cu. cm. hot absolute alcohol and then wash thoroughly with hot water. Wash any rubber on the filter paper back into the original flask and reserve this for the determination of rubber hydrocarbons. Evaporate the solution to approximate dryness, take up in warm water, and transfer to a separatory funnel. Acidify with 30 cu. cm. of 5 N hydrochloric acid, using this to rinse the beaker. Add sufficient water to make the bulk of the solution 100 cu. cm. When cool add 40 cu. cm. ether, using it to rinse the beaker in 20 cu. cm. portions. Shake the aqueous and ethereal solutions thoroughly. After complete separation draw off the aqueous solution and treat in another separatory funnel with a fresh 20 cu. cm. portion of ether. Continue to shake the aqueous solution with fresh portions of ether until a colorless portion has been obtained, then shake out twice more. Unite the ethereal solutions and wash with successive additions of water, continuing twice after the water shows no acid reaction. Filter through a plug of extracted cotton into a tarred flask, wash the filter and funnel with ether, evaporate the ether without boiling, and dry the residue at 95-100 deg. C.; cool in a desiccator and weigh. Continue to dry until constant weight is obtained.

RUBBER HYDROCARBONS

Add to the flask containing the rubber residue from the alcoholic potash extraction sufficient water to make the total volume of the solution 125 cu. cm. and then add 25 cu. cm. concentrated hydrochloric acid. Heat for an hour at 97-100 deg. C. Decant the supernatant liquid through a hardened filter paper on a Buchner funnel 7 cm. diameter, using suction; wash the residue with 25 cu. cm. hot water and decant. (While a Buchner funnel is recommended, it is permissible to use an 11 cm. hardened filter paper with platinum cone in a 60 deg. funnel.) Perform this entire treatment with water and hydrochloric acid three times and save the first and second decantations for the "organic matter" test described in section 36. The rubber at this stage should be white and practically free from black specks of undissolved fillers; if not, continue the acid treatment until the black specks disappear. (If carbon is present all the particles of rubber will be grayish, bluish, or black, depending on the form and quantity of carbon used. Black specks in light particles of rubber usually indicate the presence of lead sulphide, which must be removed to prevent the formation of lead sulphate on igniting the residue C.) Add 150 cu. cm. hot water to the flask and let stand on a steam bath or hot plate for half an hour and decant through the filter paper. Return to the flask any rubber that goes on the filter paper. Repeat until the washings are free from chlorides. (See section 36.) Transfer all the rubber in the flask to the filter paper and dry as much as possible by suction. Wash the rubber with 50 cu. cm. of 95 per cent alcohol, using suction. Transfer the entire residue to a weighing bottle. Dry at 95 to 100 deg. C. for an hour, cool in a vacuum desiccator under reduced pressure, and weigh. Dry for a half hour, cool, and weigh, repeating this process until either constant weight is reached or the weight starts to increase. Let this weight be represented by C. On a portion D of this residue C determine the ash E according to section 30 and the sulphur F in the ash E. Determine the sulphur H in another portion G of residue C. Make all sulphur determinations as described under Total Sulphur.

Place about 0.5 grams of residue C into a weigher porcelain crucible. Let the weight of residue be represented by D. Heat gently, gradually driving off the volatile matter. When the crucible has ceased to smoke raise the temperature gradually to between 450 and 500 deg. C., until all organic matter has been burned away, which is usually indicated by the ash becoming white. (An electric muffle furnace with pyrometer is recommended for this purpose.) Cool in a desiccator and weigh, the weight of ash being represented by E in the formula for rubber hydrocarbons. Make sulphur test on ash by the method described under Total Sulphur. If, however, $50 \times C \times E$ is not over unity, the determination of sulphur in the ash may be omitted and F assumed to be zero.

Then,

$$\text{Rubber Hydrocarbons} = \frac{100}{4} C \left[1 - \frac{E-F}{D} - \frac{H}{G}\right]$$

expressed as a percentage of the total sample.

TOTAL SULPHUR

Place a 0.5 gram of rubber in a porcelain crucible of about 100 cu. cm. capacity. Add 20 cu. cm. nitric-acid-bromine reagent, cover the crucible with a watch glass, and allow to stand for one hour. Heat very carefully for an hour, remove the cover, rinsing it with a little water, and evaporate to dryness. Add 5 grams of the KNO_3—Na_2CO_3 fusion mixture and 3 to 4 cu. cm. of distilled water. Digest for a few minutes and then spread the mixture half way up the side of the crucible to facilitate drying. Dry on a steam bath or hot plate. Fuse the mixture, using a sulphur-free flame until all the organic matter has been destroyed and the melt is quite soft. Allow to cool, place the crucible in a 600 cu. cm. beaker, and cover with water. Digest 3 or 4 hrs. on the steam bath. Filter into an 800 cu. cm. beaker, washing thoroughly with hot water. The total volume should be about 500 cu. cm. Allow to cool, add 7 to 8 cu. cm. concentrated hydrochloric acid to the filtrate, and heat on the steam bath. Test the solution for acidity with congo paper and add 10 cu. cm. of hot barium chloride solution. Allow to stand over night, filter, wash, weigh the barium sulphate, and calculate the sulphur.

SPECIFIC GRAVITY

The specific gravity shall be the ratio of the weight of a given volume of the compound to the weight of an equal volume of water, both at 20 deg. C. Cut strips of the largest practicable size from the conductor and use about 5 grams for the sample. Determine the specific gravity in the usual manner by means of a specific-gravity bottle. Care must be taken that no air bubbles adhere to the sample.

CHECKS

Specific gravity determinations shall check within 0.01. The other duplicate determinations shall check within the following limits expressed as percentages of the original sample:

Determination—	Check
Acetone extract	0.10
Saponifiable acetone extract	0.10
Unsaponifiable resins	0.10
Waxy hydrocarbons	0.10
Free sulphur	0.05
Chloroform extract	0.10
Alcoholic potash extract	0.10
Rubber hydrocarbons	0.20
Total sulphur	0.10

INTERPRETATION

The percentage of rubber shall be considered to be the sum of the rubber hydrocarbons, saponifiable acetone extract, unsaponifiable resins, chloroform, and alcoholic potash extracts expressed as percentages. If the chloroform extract is over 3.0 per cent of the rubber so calculated subtract the excess from the rubber. If the alcoholic potash extract is over 1.8 per cent of the rubber, as first calculated, subtract this excess also from the rubber.

RED LEAD

Dissolve 1 gram of the sample in 75 cu. cm. Xylol at a temperature of about 100 deg. C. When the rubber is dissolved the absence of any red particles indicates the absence of red lead. If red particles are present filter the solution into a Gooch crucible and wash thoroughly with benzol, acetone, and alcohol suc-

cessively. Remove the felt and residue to a distilling flask, add 25 cu. cm. 10 per cent hydrochloric acid, and distill over the chlorine liberated by the lead peroxide, absorbing the gas in a solution of potassium iodide and starch. Not more than 0.1 cu. cm. of 0.1 N thiosulphate shall be required to titrate the iodine liberated.

ORGANIC FILLERS

Transfer the first and second decantations of the hydrochloric acid solutions to a carefully cleaned porcelain dish and add 20 cu. cm. concentrated sulphuric acid. Place dish on steam bath or hot plate to drive off water and hydrochloric acid. A pronounced charring of the residue indicates the presence of organic matter soluble in water or hydrolyzed by hydrochloric acid.

Examine filter paper and rubber while decanting acid solution and again while washing free of chlorides. Some types of organic fillers not removed by water and hydrochloric acid would be plainly visible at this point.

Place a small portion of residue *C* under a microscope and examine for fibrous and other characteristic organic material. If organic fillers are indicated and not clearly proven by this test place 1 gram of the organic sample in a beaker, add 75 cu. cm. Xylol, and heat on hot plate until the rubber is dissolved. Decant Xylol solution and wash residue with ether several times by decantation. Dry residue and examine under the microscope.

STATEMENT OF RESULTS

The results of the analysis shall be stated in the following form:

	Per Cent
Acetone extract	
Saponifiable acetone extract	
Unsaponifiable resins	
Waxy hydrocarbons	
Free sulphur	
Chloroform extract	
Alcoholic potash extract	
Total sulphur	
Rubber	
Color of acetone extract (60 cu. cm. vol.)	
Fluorescence in acetone extract solution (present or absent)	
Hydrocarbons *A* (consistency and color)	
Hydrocarbons *B* (solid or liquid)	
Color of chloroform extract (60 cu. cm. vol.)	
Carbon (present or absent)	
Organic fillers (present or absent)	
Red lead (present or absent)	
Specific gravity	
Sample braided or not	

Part IV—Explanation of Specifications

Experience has shown that compounds of the grade which contains only good Hevea rubber may be relied upon to be more permanent than those made of rubber of other grades. It is not affirmed by the committee that a compound which conforms with this specification is necessarily permanent, or that a better compound cannot be made, but it is believed that enforcement of the specification will limit the use of inferior materials and that it will put the manufacturers more nearly upon an equality of endeavor, where they can use their experience to obtain the best results. Used in connection with the analytical procedure, the specification will enable purchasers to order a good compound and to ascertain with a greater certainty than heretofore whether the material received represents the compound specified.

The term Hevea applied to rubber means rubber from the *Hevea Brasiliensis* tree, whether wild or cultivated and regardless of the locality in which it has been grown. Para rubber is Hevea rubber of the kind originally shipped from the port of Para, Brazil, and comes in several grades. The rubber required by this specification should be Hevea rubber of good quality, such as fine Para or best quality plantation rubber.

Carbon is excluded not only because it is considered by some purchasers to be deleterious, but because it interferes with the determination of rubber hydrocarbons.

Red lead is excluded because of the possibilities of its deleterious effects on the rubber.

Ozokerite is prohibited because the acetone extract obtainable from it interferes with the separation of the acetone extract obtainable from the rubber, thereby vitiating the assay of the rubber extract. This prohibition is unimportant to the manufacturers, as ceresine, which is permitted, is the essential constituent of ozokerite.

An upper limit is placed upon the rubber in order to prevent the attainment of electrical and mechanical strength by the use of an extra quantity of inferior rubber whose lasting qualities might not be satisfactory.

The hydrocarbons are limited owing to their tendency to separate from the compound and thus possibly cause porosity.

The free sulphur is limited because an excessive amount may be deleterious.

The maximum limit on the saponifiable acetone extract is to prevent the use of raw or reclaimed rubber with high saponifiable extract. The minimum limit assists in forcing the use of Hevea rubber, since it is characteristic of the acetone extract from Hevea rubber to be largely saponifiable.

The unsaponifiable resins are limited because a low proportion of unsaponifiable resins is characteristic of Hevea rubber. A high result might be due to the presence of reclaimed rubber.

The chloroform extract is limited, first, to prevent the use of bituminous substances, and, second, to limit depolymerized and undercured rubber.

The alcoholic potash extract is limited to prevent the use of saponifiable rubber substitutes.

The specific gravity is limited to reconcile the specification of ingredients by weight with the practice of purchasing material by volume.

Fluorescence of the acetone solution is prohibited as it indicates the presence of bituminous substances, rosin oil, or mineral oil.

The color of the acetone extracts is specified to conform with the normal color of the extract from Hevea rubber. A darker color indicates adulteration or an inferior grade of rubber.

The hydrocarbons are required to be solid in order to prevent the use of oils and paraffine of low melting point. The shade required is that obtained from paraffine wax or ceresine. If hydrocarbons *B* are liquid this would indicate reclaimed rubber softened with mineral oil, or paraffine of low melting point.

The color of the chloroform extract is specified to conform with the color of dissolved gum in minute quantities. The presence of bituminous substances would be indicated by a brown or black color.

It would be desirable that the sulphur of vulcanization be limited to exclude reclaimed rubber, which contains the sulphur of its previous vulcanization, but the committee has not yet developed an acceptable method for determining this quantity. It is therefore confronted with the choice of either placing a limit on the total sulphur or giving up the attempt to exclude shoddy by sulphur limitation. Option is therefore given to the purchaser to insert or omit the limit on total sulphur. Such insertion will at times exclude reclaimed rubber, and the committee believes it possible to make a suitable compound with this limitation. The committee thinks that a sulphur limit positively excluding reclaimed rubber would place too great a hardship in other ways on the manufacturers. Where the specification is used with no total sulphur limit, the use of many kinds of, or much, reclaimed rubber will be guarded against by the limits of the various components of the acetone extract. When the limitation on total sulphur is omitted sulphur-bearing fillers which possess certain advantages may be used.

This specification should be supplemented by appropriate elasticity and tensile strength tests in order to add to the assurance that good rubber has been used and that the vulcanization process has been properly carried out; also by appropriate electric stress and resistance tests to assure proper insulating qualities and homogeneity of structure. The exact value of the limits for these tests will depend upon the use to which the material is to be put.

Part V—Explanation of Procedure

The tentative report of the committee, presented in October, 1913, provided for the determination of the percentage of rubber present by the method of difference. The mineral fillers were determined by the terebene solution method. Results obtained in the use of this method showed that it gave inaccurate results on some compounds. The committee therefore determined to abandon it and to find a suitable substitute. It is believed that the method now recommended will satisfactorily solve the problem.

The most feasible means of limiting the kind of rubber was considered to be the determination of the saponifiable and unsaponifiable resins. These are fairly constant characteristics of the resins of Hevea rubber and of compounds made from the same. Other methods, such as the determination of the saponification number and the optical activity of the resins, were thought to be unpractical.

The method as developed is applicable to the analysis of any pure rubber compound containing only mineral matter with or without ceresine or paraffine wax, regardless of the kind or amount of rubber, and can be used in conjunction with other specifications provided the limits are changed to correspond with the amount and kind of rubber desired and due consideration is given to interfering mineral matter. When applied to a compound without ceresine or paraffine wax the unsaponifiable acetone extract is the unsaponifiable resins.

The method has been definitely described to make it certain that experienced chemists may obtain concordant results. The interpretation has been rigidly defined, obviating any ambiguity as to the meaning that will be assumed, even though this sometimes appears to be arbitrary.

SAMPLE

In order to obtain uniform results the committee has established by experiment that a definite method of sampling has to be adopted and that for all extractions the sample must be reduced in a prescribed manner to at least an approximately similar degree of fineness. For this reason the procedure specifies a definite type of grinder obtainable in two forms, and also specifies definite sieves.

EXTRACTION APPARATUS

The committee has proved that the extraction apparatus used by different chemists must be of exactly the same form and the same size. It was also proven that small samples in the apparatus give the maximum results and that the rate of extraction is dependent upon the amount of solvent and its temperature as it passes through the sample. The apparatus finally adopted combines the advantages of several forms that were studied and, together with simplicity of operation and adjustment to uniform conditions, gives practically complete extraction when used as specified. A number of other variations that might have a possible effect upon the amount of extract were tried, but found to be inappreciable.

The extraction is made within 24 hrs. of the preparation of the sample, so obviating any appreciable oxidation. Two samples are extracted and united, so that a larger amount of extract may be obtained for the subsequent separations and the extraction apparatus kept within a convenient size. Hot chloroform is used to facilitate the complete transference of the extract. The flasks are placed on their sides when drying, to hasten the emission of the solvent and thus reduce chance of volatilizing through longer heating some of the more volatile constituents of the extract. Drying in vacuo at room temperature does not remove all the moisture if paraffine is present, and such drying with heat or at 100 deg. C. in inert gas presents no practical advantage over the method given.

SEPARATION OF THE ACETONE EXTRACTS

The method given was developed so that all the desired constituents could be determined on one sample.

Emphasis is laid on thorough extraction of the unsaponifiable material and the retention of the flocculent material with the ethereal solution. This latter material is not soluble in either ether or water, but it was proven that if such as was chloroform-soluble was included in the unsaponifiable material the subsequent determination of the hydrocarbons would be more exact. A portion of this flocculent material is insoluble in chloroform.

The hydrocarbons are determined in two places, making an approximate separation between the solid and the liquid ones, if both are present. The first hydrocarbons *A* are those insoluble in the solvent at a low temperature. The presence of unsaponifiable resins in the solution prevents the more complete freezing out of the hydrocarbons, but the remainder is obtained after treatment of the resins with sulphuric acid. In this way chance of loss through the action of the acid has been largely eliminated.

The method for free sulphur gives all the sulphur in the acetone extract with the exception of negligible amounts which may be in the unsaponifiable material. It was proven that the results agree with determinations made directly on other acetone extracts.

The saponifiable and unsaponifiable resins are obtained by difference.

CHLOROFORM EXTRACTION

The chloroform extraction should be made at once after the acetone extraction or the sample put in a vacuum, so as to avoid the danger of an abnormally high extract. When the extract is dried as specified constant weight is obtained before any appreciable oxidation occurs. If bituminous substances are present that portion which has not been extracted by the acetone will be largely soluble in chloroform and can be readily distinguished by its color. The amount of extract is also affected by the presence of uncured and inferior rubber. A properly cured Hevea compound will always give a little extract with chloroform, which varies somewhat with the method and conditions of cure.

ALCOHOLIC POTASH EXTRACTION

The alcoholic potash extraction is the usual saponification process for obtaining the fatty acids of rubber substitutes. The total amount of such substitutes is not obtained, but if any appreciable amount is present the value will exceed that of the limit allowed. When no substitutes are present this determination always yields a small amount of extract from Hevea rubber.

RUBBER HYDROCARBONS

Methods for the determination of the percentage of rubber are of two kinds, the direct

and the difference methods. The committee adopted a different method after trial of various methods, both direct and indirect.

The difference methods are those in which the rubber is removed and the residue weighed. This may be done in either of two ways: by the use of solvents or by ignition. The early work of the committee was largely along the line of removing the rubber by means of solvents. Many kinds, and probably every class, of rubber solvents were tried. Some did not completely dissolve the rubber at low temperatures and ordinary atmospheric pressure; others appeared to dissolve the rubber, but formed a colloidal solution holding some of the fillers, which could neither be filtered nor centrifuged clear of mineral matter. Many of them were so time-consuming as to render them worthless, even if accurate results could be obtained. The solvent method given in the Preliminary Report was found to give inaccurate results with compounds containing much litharge or zinc oxide, but gave very good results on most classes of compounds if Xylol, instead of terebene is used as the solvent. It has since been demonstrated, however, that it is practically impossible to obtain correct results on an important class of compounds, and that method was therefore abandoned.

Ashing the compound gives fairly accurate results, provided no volatile or decomposable fillers are included. This, however, cannot be assumed to be the case. In the method which the committee recommends these objectionable fillers are largely removed before the compound is ignited, and provision is made for testing those few materials which are volatile, but not removed. This method is a modification of an unpublished one devised some years ago by G. H. Savage.

In the testing of this method compounds containing most of the known commercial inorganic fillers were analyzed. Whiting, talc, magnesium, and lead compounds and barium carbonate, which are objectionable in direct ashing, do not in any way interfere with the determination of rubber by this method. A number of organic fillers were used, but these, too, did not cause any great error.

The securing of accurate results by the method given depends largely on two things: the complete solution of decomposable fillers and the removal of all chlorides. With these precautions the analyst is almost certain to obtain reasonably accurate results. The formula for calculating the rubber hydrocarbons presents no difficulty if the exact quantities called for in the method are used.

The rubber as it is weighed under *C* contains sulphur in combination with the rubber. On ignition sulphur is driven off with the rubber. By determining the sulphur before and after ignition the amount so lost can readily be calculated and the proper correction made.

TOTAL SULPHUR

The sodium peroxide method specified in the committee's Preliminary Report is widely used in the analysis of wire insulation and is known to yield accurate results on such compounds. The liability of explosion with that method, however, renders it somewhat objectionable.

It will be noted that the bromine-nitric-acid method which is now specified does not require the dehydration and separation of silica. If the filtrate after the fusion and extraction with water is acidified in the cold and after the precipitation of the barium sulphate the solution is not permitted to concentrate to a relatively small volume any silica which is in solution will remain dissolved. The elimination of this step by proper precautions saves considerable time without in any way interfering with the accuracy of the determination.

INTERPRETATION OF RESULTS

Emphasis is laid on the method of calculating the results. The saponifiable acetone extract and the unsaponifiable resins are considered to be parts of the rubber. The chloroform and alcoholic potash extracts, when within the limits specified, are also so considered. Any quantity in excess of these limits is assumed to be due to foreign substances or in case of chloroform extract, to undervulcanized rubber. No allowance is made for the ash in the raw rubber, as it is considered to be negligible. This method of calculation has to be adopted if the rubber found is to agree with that originally put into the compound.

MOISTURE

A determination of moisture is not given, as electrical tests will detect its presence if in excess. If electrical tests are required, the error introduced by the omission of this determination is very small.

Note:—With a procedure of this length it is impossible to explain every detail without undue elaboration, and the committee wishes to point out that while to experienced chemists the procedure may seem overburdened by detail, yet every specified detail was found necessary in order that the conditions essential to accurate and consistent work might be reproduced by all chemists using the procedure. For this reason it is extremely important that all instructions be observed, even if their significance is not perceived by the individual chemist. It will probably be found that even with the instructions properly observed, some experience will be needed to apply the method successfully.

Part VI—List of Important Specifications Containing the Joint Rubber Insulation Committee's Chemical Clauses for Analytical Procedure

American Electric Railway (Engineering) Association:
Standard Specification for Rubber Insulated Wire and Cable.

American Society for Testing Materials:
Proposed Specifications for Insulated Wire and Cable; 30 per cent Hevea Rubber.

Association of Railway Electrical Engineers:
Standard Specifications for Wire and Cable.

Interborough Rapid Transit Co., Motive Power Department, New York:
Specification No. 2.

New York Central Railroad Co., Electrical Department:
Specification No. 300.

Panama Canal:
Office of General Purchasing Agent, Circular No. 1038.

Signal Corps, U. S. Army:
General Specification No. 581—A., etc.

S. A. E. Tire and Rim Standards

The following recommendations as to new and revised standards approved at the Annual Meeting of the S. A. E., have been adopted in their entirety by a letter ballot of the voting members:

CARRYING-CAPACITIES OF SOLID TIRES

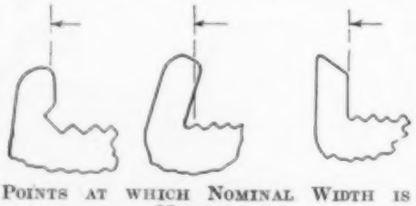
1. The Division recommends the following as a standard table for the carrying-capacities of solid rubber tires.

Nominal width of Tires	Gross Load Per Wheel in Pounds Tire Diameter 36 in. and under	Tire Diameter 40 in. and over
3 in.	1000	
3½ in.	1300	
4 in.	1700	
5 in.	2500	2600
6 in.	3300	3500
7 in.	4200	4500

2. This is a subject which has been under consideration in various Divisions of the Standards Committee for many years, during which it has been repeatedly reviewed without ability to make specific recommendation up to this time. Recent discussions have taken special cognizance of present practice in this field and in formulating this table a special effort was made to base it upon the best available engineering information in the hands of the tire companies. The above table represents the only compromise acceptable to a majority of leading tire makers. This schedule, if adhered to rationally, and if not abused by overloading, will give very satisfactory tire life.

SOLID TIRE WIDTHS

3. It is recommended by the Division that the standard width of solid tires be



POINTS AT WHICH NOMINAL WIDTH IS MEASURED

defined as the "nominal" width in inches as measured inside the channel at the mean of the vertical seat of the rubber, plus or minus 1/16 in.

CARRYING-CAPACITIES AND INFLATION-PRESSURES OF PNEUMATIC TIRES

4. The Division has this important subject under active consideration and hopes to make a final report embodying a table of standard or recommended practices at the next Standards Committee meeting.

TYPES OF RIMS FOR STANDARD PNEUMATIC TIRE SIZES

5. This subject is also under active consideration and with the cooperation of the Clincher Automobile Tire Manufacturers Association will probably be submitted in final form at the next meeting.

SOLID TIRE CHANNEL CONTOURS

6. Preliminary discussion has been held on the advisability of evolving a standard channel section for pressed-on and demountable solid tires. The development of this standard will probably take considerable time but it is believed that the possible advantages to be gained are very conisderable, and the Division hopes to make material progress on the question soon.

Respectfully submitted,
TIRE & RIM DIVISION
K. W. Zimmerschied, Chairman.

DEMOUNTABLE RIM STANDARDS FOR MILITARY TRUCKS

At a meeting of the Tire and Rim Division held on April 23 at Cleveland, the most important action taken was the formulation of a recommendation to the War Department in regard to demountable solid tires for military trucks. Drawings of proposed designs had been prepared by the Quartermaster General's Department, showing several types of wedge rings and side flanges, some of which were interchangeable. The discussion at the meeting showed that this arrangement could be considerably simplified if the tire channels were designed so that one section of wedge ring could be used for both single and dual tires, regardless of the sectional size of the tire. Only one section of center wedge ring would be required between dual tires of any size, and only one type of side ring would be needed for all widths of single and dual tires.

Charges Standard Oil Is Monopoly

The Federal Trade Commission, in a report transmitted to the Senate, has asserted that Standard Oil interests substantially dominate the gasoline industry—refining, pipe line transportation, and marketing. Despite dissolution of the so-called "Oil Trust" by the United States Supreme Court, the Commission concludes that Standard Oil domination has had a "fundamental bearing" upon gasoline prices, declared to have been arbitrarily increased. In an exhaustive report of its investigation the Commission declares in substance that real competition does not exist between the various Standard Oil companies because of interlocking stock ownership through the holding of a majority of shares in the constituent Standard companies by identical interests. Legislation to meet these conditions is recommended by the Commission. Also its evidence and findings have been transmitted to the Attorney-General for appropriate action.

Freight Rates Go Up 15 Per Cent

A 15 per cent advance in freight rates, effective June 1, has been granted the railroads on their petition by the Interstate Commerce Commission. The order is subject to recall, but it is not thought likely that it will be revoked in view of the good case made out by the railroads in demonstrating that their financial safety demanded increased revenues in considerable amounts. The raise, which will affect the industry directly through its heavy shipments of raw materials, will also throw a considerable burden on the consumer living at points remote from the factories.

PRESIDENT
LESTER D. GARDNER

THE RUBBER AGE

EDITOR
HERBERT M. WILLIAMS

Vol. I | May 10, 1917 | No. 4

THE new revenue bill introduced in the House contains many features that demand the attention and consideration not only of the rubber industry, but also of everyone interested in the continued success and progress of the industrial activities of the country. It appears that Congress, desirous of raising a large amount of money and anxious to avoid a heavy bonded indebtedness such as has been incurred by some of the Allies, has, perhaps, laid overmuch stress on the necessity of supplying, through immediate taxation, a large proportion of the war's cost.

The war must be supported; it must be amply financed; but lawmakers in Washington might do well to pause and consider that the successful financing of a government is controlled by the same economic laws that govern business and commerce. They should remember that industry cannot suddenly be handicapped, that the volume of business cannot be radically curtailed, without seriously affecting the opportunities for raising revenue.

This is the time when the government and the people must be fair with industry; economic conditions must be preserved and maintained, if money is to be raised. It is an easy matter for a rich country to raise almost unlimited funds by taxation in prosperous times, but excessive taxation may affect industry and make the problem exceedingly difficult.

Industrial America is more than willing to give the government full financial support, but it must earn before it can give. If offered the opportunity of earning freely, it can stand taxes of an abnormal character. With prosperity curtailed, power to give is correspondingly lessened.

It is thought by many that in the proposed bill for revenue, an attempt has been made to raise a sum so large that it will unduly tax industrial development and progress, and that not sufficient attention has been given to the conditions that will promote continued prosperity.

With a flat tax of ten per cent. on crude rubber and on all other imports that have heretofore been duty free, with a surtax of ten per cent on all other imports, with a five per cent tax on automobiles, tires and tubes, with the excess profits tax doubled, with income taxes largely increased and with many other taxes imposed, the rubber industry, as well as every other industry, will, if this bill becomes a law, have to undergo careful readjustment to properly meet the new conditions.

What changes will be made in the revenue bill before it is finally enacted into a law, no one knows. From what can be learned, the best opinion at Washington holds that many changes will be made. It is believed that the Finance Committee of the Senate will make radical alterations. What influence manufacturing, financial and commercial interests will bring against the measure, what changes for better or worse will be made, no one can hazard more than a guess.

From those in close touch with the situation at the Capital, the opinion is expressed that the proposal to place ten per cent duty on crude rubber and many other materials not produced here may be overruled after mature deliberation. The question of a tax of five per cent on automobiles, tires and tubes is a serious one, although it has as yet received but small attention from the tire manufacturers, who may not be able to pass the entire burden on to their customers. By far the most serious part of the situation, from a national viewpoint, is the fact that such a tax will tend to restrict the already insufficient means of transportation.

Income taxes, both personal and corporation, excess profits taxes and the many taxes that are proposed on commodities of all kinds, are inevitable. Before any definite decision is made, the subject should be very carefully studied, and the taxes should be so arranged that no undue burden be laid on any one class. All taxes should be equitable and just. At this time, when all our energies must be devoted to the successful early termination of the war, every influence must be exerted toward sustaining and improving industrial conditions and encouraging continuous prosperity. Manufacturing, business and commerce should not be hampered by theoretical and hasty makeshifts. This is no time for experiments. Now if ever it is essential that business methods, business sense and business experience guide the nation's destinies.

When the new revenue law goes into effect, regardless of many changes that will doubtless be made in the provisions of the bill now before the House, all business interests will be confronted with new conditions and new problems. Manufacturers and dealers will do well to give these early consideration, for while the country has never been in as good a position as now to face a period of adjustment to new and strange conditions, it cannot be denied that the situation is one of extreme uncertainty. Keen foresight, broad judgment, and cool headedness are qualities that will count in directing business and industry through the days that are to come.

The War Revenue Bill Proposes to Tax Rubber

Sweeping Changes Are Made—The Free List Is Abolished—Ten Per Cent to Be the Minimum Tariff—All Other Taxes Are Raised—New Ones Are Added—H. Stuart Hotchkiss Discusses the Situation

The Ways and Means Committee of the House of Representatives has reported the new war revenue bill, which is designed to raise $1,800,000,000. Should this law go into effect crude rubber would be subject to an import tax of 10 per cent.

The new section of the bill eliminating the free list of the Underwood-Simmons law and imposing a horizontal increase of 10 per cent ad valorem on the dutiable articles enumerated in that law reads:

> That on and after the day following the passage of this act there shall be levied, collected, and paid upon all articles when imported from any foreign country into the United States, or into any of its possessions (except the Philippine Islands and the Islands of Guam and Tutuila), if such articles are now dutiable by law, a duty of 10 per cent ad valorem in addition to the existing duty (whether ad valorem or specific), and if not now dutiable by law, a duty of 10 per cent ad valorem. The duties imposed by this section shall be levied, collected, and paid under the provisions of existing law.

Another provision which may have far reaching effect on the industry follows:

> Upon all automobiles, automobile trucks, automobile wagons and motor cycles, and automobile, motor cycle, or bicycle tires (including inner tubes) sold by the manufacturer, producer, or importer, a tax equivalent to 5 per centum of the price for which so sold, provided that from the tax which otherwise would be imposed upon a manufacturer, producer, or importer of automobiles, automobile trucks, automobile wagons, or motor cycles there shall be deducted the amount of any tax imposed by this subdivision upon the tires used thereon.

In addition to increased personal and corporation taxes, the bill, as framed, provides for a retroactive tax upon incomes for the calendar year of 1916. An excess profits tax increases the present rate to 16 per cent in excess of net earnings of 8 per cent plus $5,000.

Inheritance tax increases are proposed by the bill ranging from one-half of one per cent on estates of $50,000 and 15 per cent on estates of $15,000,000 or more. Subscribers for telephone service will be taxed 5 per cent on account of their bills and 5 cents on each telephone or telegraph message amounting to 15 cents or more. The tax on distilled spirits, fermented liquors and tobacco are approximately doubled, many proprietory preparations are taxed, and a long list of documentary stamp taxes is provided for.

The war surtax of 1 per cent is authorized for each letter or post card and second-class or publisher's postage rates are increased.

The unsettled mind of the committee is evidenced by the radical changes in the bill that were made previous to its presentation. Vigorous opposition to the measure is foreshadowed, and best opinion in Washington is that the Senate Finance Committee will make radical changes in the measure before it is finally enacted.

H. Stuart Hotchkiss Tells of Crude Rubber Conditions

The new revenue bill containing a provision to impose a ten per cent duty on all imports would have a far reaching effect upon the rubber industry as it would impose a ten per cent duty on crude rubber.

The interests of the rubber industry are being looked after by the Legislative Committee of the Rubber Association, of which H. Stuart Hotchkiss, President of the General Rubber Co., is a member.

Speaking to a representative of THE RUBBER AGE, Mr. Hotchkiss said he might possibly be too apprehensive as to the effect that an import tax would have with reference to curtailing importations, but that his apprehensions were sincere. He continued, "I feel that the stocks on hand of crude rubber are not quite adequate to afford the assurance that the country should have against an interruption of ocean traffic. The market price of first grade Plantation Rubber in London is approximately 37d. which figured with exchange at $4.76½ makes it cost 73.46 cents per pound. Charges to New York are approximately 7 cents a pound, which makes the rubber purchased in London cost 80 cents in New York. Then adding 10 per cent the rubber would cost with the proposed duty approximately 88 cents a pound, which is a high figure when it is considered that the average for this grade of rubber in 1915 was 65½ cents and in 1916—73 cents.

"In normal times manufacturers carry about three months' supply of rubber at the mills. Today this reserve is cut to about one month. What I fear is that with rubber at 88 cents, manufacturers will be inclined to take chances and will hesitate to increase their stocks to a three months' basis, which I believe is essential for safety.

"Looking at the question from the viewpoint of the industry, manufactured goods are at a very high level, due to the great increases in other materials, notably cotton. Labor, too, has added substantially to the cost. Manufacturers will raise their prices to cover these increased costs, and I fear that by the time the manufactured articles are offered to the public, the price will be largely in excess of the 10 per cent which the Government will derive from crude rubber. An increased cost on rubber goods will curtail production in proportion to the amount of the increase.

"With reference to the question of forward contracts for manufactured articles, let me say that even if legislative provision would be made whereby the manufacturer might pass the tax on to the buyer by an increase in prices, regardless of contract, I am informed by those who have made forward sales of manufactured goods, that in most cases this would be impossible to accomplish, despite legislation making it permittable.

"Insofar as forward sales of crude rubber are concerned I believe that all brokers and dealers have inserted clauses to provide for such a contingency, so that no hardship would be worked upon them.

"As to the matter of drawbacks on rubber goods exported, I cannot see how it would be possiblbe to allocate the rubber so consumed unless the Government should arbitrarily rule that rubber shoes contain so much rubber, and tires of various sizes so much, and so on. For instance, the percentage of rubber used in rubber shoes varies with each manufacturer and with each grade of goods made. The proportions of various kinds of rubber blended in every article also varies not only with different manufacturers but with the same manufacturer from week to week or from month to month, according to the market conditions and the various kinds of rubber available.

"Strange as it may seem, European manufacturers are aggressively seeking foreign business at the present time, as is evidenced by the keen competition which American manufacturers are experiencing in South America and other quarters, on the part of both British and French companies. European nations are doing all in their power to develop and encourage industry, both as a source of revenue at the present time and with an eye to controlling export markets at the end of the war.

"It would seem to me that the American Government should pursue a similar course and do all within its power to assist American manufacturers in developing at home and in expanding their foreign business. Even though a provision were made for a drawback of duty on rubber exported, the practical difficulties suggested before would in my opinion, practically nullify the rebate, which would mean complete inability on the part of American manufacturers to compete in export fields.

"To the best of my knowledge and belief no other country in the world except Canada places an import tax on crude rubber. Canada taxes imports from British possessions 5 per cent, and rubber from other sources 7½ per cent. Most of the rubber produced in the world comes from the Federated Malay States and from Brazil. The former country imposes an export tax of 7½ per cent, the latter of about 23 per cent.

"The policy of the British Government, for economic reasons, is to divert as much of the British-grown rubber as possible to London, to be redistributed from that point. No export tax has as yet been placed by Great Britain on shipments from the British Isles, but if as a revenue measure the British Government should impose an export tax—which is a strong possibility—the economic position of American manufacturers would be possibly untenable.

"American manufacturers desire to bear their legitimate financial responsibility, increased by the necessity of the war, and the industry realizes as fully as any group of men in the country the absolute necessity of raising revenue. Twelve million dollars, which I understand is the sum that it is estimated a 10 per cent tax would yield the Government, is a very considerable sum of money, but it does not, I believe fully represent the additional amount of money which the American consumer would have to pay for his rubber goods under the plan proposed.

"It has been claimed by Government officials that a tax at the Custom House is the easiest, quickest and most inexpensive tax to raise. This is unquestionably true, but would not a stamp tax on finished manufactured articles be almost as effective from the Government's standpoint? It could be arranged to raise at least $12,000,000, possibly much more than this amount, and by obtaining the revenue in this way the industry as such would not be disturbed and forced to re-adjust.

"It seems to me that the interests of the country at large and the interests of the rubber industry are identical. First, the rubber industry is willing and anxious to contribute $12,000,000, or a larger amount to the national budget; second, it is desirable, both from the standpoint of public welfare and manufacturers, that stocks of rubber in the United States should be increased as a safety measure, and, third, it is mutually desirable that American industry should expand and prosper, and that the United States should hold and further develop the export markets in which we have already obtained such a substantial foothold."

Employes Are Helped to Increase Food Supply

Factories Are Encouraging Their Employes to Cultivate Gardens—The Methods Used by the American Woolen Co. Are Attracting Attention

Helping Employes to Garden

The urgent need of increasing the food supply has been met by many of the leading manufacturing interests of the country by offering vacant property around their factories and mills to their employes for cultivation. Efforts of many kinds have been made to encourage the growing of food products. Some of the leading rubber manufacturers, such as the Firestone, Goodyear, and the Pennsylvania companies have been actively aiding their employes in cultivating gardens.

The American Woolen Co. has stood out prominently among manufacturers in other lines for the thoroughness in which it has planned and arranged for the tilling of lands around its various mills. The system that has been employed by this company is described by one of its officers as follows:

"We have appointed committees of the agents of our various mills, which are located throughout New England and in the State of New York. These committees cooperate with the city officials and local committees.

"We donate the use of any vacant land which we may have in the various communities in which our mills are located, do the plowing and preliminary cultivation at our own expense, furnish seeds and fertilizer to our employes at cost, with six months' credit or more if required. We also allow them to pay for this in weekly installments if they wish. The crops, of course, are given to the employes and divided among them according to the amount of work done by each. In one case one of our mills is planting 100 acres.

"We have found in nearly all mills that the employes are very enthusiastic and have formed committees of their own. They do the necessary work after mill hours, Saturday afternoons, and Sundays. In every case we have placed the various committees in touch with the State Department of Agriculture; in Massachusetts, of course, this is the Massachusetts Agricultural College, at Amherst; in Vermont, the University of Vermont; in Maine, the University of Maine, etc.

"Printed matter, such as is issued by the Committee on Public Safety of Massachusetts, is purchased and distributed to our employes free of charge. So far the scheme is working out most satisfactorily, and we expect most successful results."

Among the printed matter that is distributed is a cloth sign for posting on trees or fences warning against trespass; a bulletin entitled "The Home Vegetable Garden," issued by the Massachusetts State Board of Agriculture, and the following card instructions and charts: "Farmers' Home Garden," "Planting Table for the Home Vegetable Garden," and "Plan for Family Garden," issued by the Extension Service of the Massachusetts Agricultural College at Amherst, Mass., and "Useful Varieties for the Vegetable Garden" and "Plant Food Fertilizers," issued by the Essex County Agricultural School at Hawthorne, Mass.

Penn. Rubber to Help Increase Food

The Pennsylvania Rubber Co., Jeannette, Pa., has offered to plow and prepare 60 acres of land for those desiring to use it for gardening purposes. It is said that employes are availing themselves of this opportunity.

Firestone Furnishes Garden Plots

To aid in increasing food production to its maximum, President H. S. Firestone of the Firestone Tire & Rubber Co., has announced that fifty acres of land south of the factory would be divided into quarter acre lots for factory employes to cultivate. There will be room on the land for 200 truck gardens. The factory wants to cooperate with employes who desire to do their part in assisting their country.

Goodyear to Cultivate Vacant Land

Complying with the war-time call from Washington to "protect the food supply," The Goodyear Tire & Rubber Company is already getting into intensive agriculture, in addition to its many other activities. Every foot of ground the Company owns and that is not needed immediately for building purposes will be placed under cultivation at once.

The work will be in charge of the Labor Department.

Over one hundred acres can be cultivated immediately. Additional land can be cleaned if needed. The principal crops will be potatoes, navy beans, wheat, corn, and peas.

Items of Financial Interest

The Boston Rubber Shoe Statement—Dividends Are Declared—The Sioux City Tire & Rubber Co. Buys the Alliance Plant—Other Items

The Boston Rubber Shoe Co. Statement

The Boston Rubber Shoe Co., Boston, Mass., has filed a statement of its financial condition, dated Dec. 31, 1916, which compared with previous years is as follows:

Assets—	1916.	1915.	1914.
Real estate...	$996,700	$996,700	$996,700
Machinery ...	393,579	393,538	372,744
Merchandise .	1,738,671	1,950,574	1,965,533
Cash and debts receivable .	4,518,588	4,248,870	3,995,767
Patent rights.	2,341	2,341	2,341
Miscellaneous assets	60,500	60,500	37,500
Total ...	7,710,381	7,652,525	7,371,617
Liabilities—			
Capital stock.	5,000,000	5,000,000	5,000,000
Accounts payable	198,967	154,178	106,889
Floating debt.	400,000	600,000	700,000
Reserves	218,659	218,659	218,659
Surplus	1,892,753	1,679,686	1,346,067
Total ...	7,710,381	7,652,525	7,371,617

Sioux City Co. Buys Alliance Plant

The property of the Alliance Rubber Co. and the Alliance Tire & Rubber Co., Alliance, Ohio, was sold at public sale by Receiver H. C. Koehler on April 14 to the Sioux City Tire & Rubber Co. of Sioux City, Iowa, for $45,000 cash. The appraised value of the plant and equipment was $43,499.72. The purchasers representing the Sioux City Tire & Rubber Co., who were upon the ground as bidders, were John Nagle and Charles F. Sawyer of Sioux City.

There was a large attendance of prospective buyers at the sale and the price realized is a satisfactory one to stockholders, as it represents more than the appraisement. The sale was made on record time by Receiver Koehler, who was appointed by court as receiver Feb. 16 and the sale of the property affected April 14.

The purchasers have not definitely stated what disposition will be made of their purchase but it is thought that the machinery will be shipped to the Sioux City plant and the building and grounds sold.

As to the disposition of the money received from the sale the receiver states the property was sold as the property of the Alliance Rubber Co. and the Alliance Tire & Rubber Co., and the proceeds will be disbursed according to the order of court as it may determine.

Pines Rubber Co. Opens Branch

The Pines Rubber Co., 39th Street and First Avenue, Brooklyn, N. Y., has opened a branch factory in the building of J. H. Dould, on Elizabeth Street, Farmingdale, L. I., and will start with about fifteen employes.

No Dividends on U. S. Rubber Common

Col. Samuel P. Colt, president of the U. S. Rubber Co., said recently that "there has been no discussion of any plan for resumption of dividends on the common stock in the near future." He added that a dividend is not likely this year.

The U. S. Rubber Company's earnings, he asserted, would show $20 on the common at the end of 1917, after allowing for preferred dividends. "Our earnings are very large, but we think it part of wisdom to keep them in our treasury," he explained.

Dividends Unchanged

Republic Rubber Co., Youngstown, Ohio, has declared the regular quarterly dividends of 2 per cent on the common, payable May 1 to stock of record April 25, and 1¾ per cent on the preferred, payable June 1 to stock of record May 20.

The directors are considering plant extension plans that will treble the working force.

Goodrich Declares Dividend

Payment of the usual quarterly dividend of 1 per cent on the common stock of The B. F. Goodrich Co., Akron, Ohio, was authorized at a meeting of the directors on April 25. The dividend is payable August 15 to stockholders of record August 3.

Mason Increases Capital

The Mason Tire & Rubber Co., Kent, Ohio, has increased its capital from $1,000,000 to $3,000,000, of which $1,000,000 is common and $2,000,000 is 7 per cent preferred. The increase is made to provide for a capacity of 1,500 tires a day and to furnish additional working capital.

A Rubber and Automobile Investor's Card

A card containing interesting statistics of rubber, automobile and accessory stocks has been issued by John Burnham & Co. of Chicago and New York, which should prove useful for reference to investors in these securities.

Hood Rubber Dividend

The Hood Rubber Co., Watertown, Mass., declared a regular quarterly dividend of 1¾ per cent on preferred stock, payable May 1 to stock of record April 26.

The Midgley Plant Is Sold

The Jaeger Machine Co. has purchased the plant formerly operated by the Midgley Tire Co., Lancaster, Ohio, and lately owned by the United States Rubber Co.

Activities of the Rubber Industry

New Buildings—Ajax Has Flag Raising—Recruiting in a Tire Salesroom—Asks Damage for Goods Sunk by a Submarine—Notes of Interest—Personal Items

Crown Tire Co. Building Starts

Foundations are being put in for the first building of the Crown Tire & Rubber Co. on Seventy-fourth Street, Omaha, Neb. This will be a 60 x 132 ft., three-stories and basement structure, costing about $36,000. It is planned to have it ready to equip and start manufacturing in July. Superintendent Miller has gone to Akron, Ohio, to ship additional machinery. The company is said to have put $55,000 in new machinery. It proposes to fit up the former Rogers Motor Co. building at Raison for temporary use and turn out tires there this month.

Damages Asked for Goods Submarine Sunk

Because a German submarine is believed to have sunk a liner carrying a consignment of rubber gloves and finger cots to a firm in London, England, from the Massillon Rubber Co. of Massillon, Ohio, a suit for $153.36, the alleged value of the articles lost, was brought against the Adams Express Co., on the ground that the express company was to have collected the value of the goods from an agent of the English firm in New York before allowing them to be shipped to Europe, but failed to do so. Judgment was given for the plaintiff, but the express company appealed.

Dryden Encourages Men to Enlist

George B. Dryden, president of the Dryden Rubber Co., 1014-1036 South Kildare Avenue, Chicago, Ill., has announced that all employes who have been in the company's service for a year, and who enlist in the army or navy, will be paid for the duration of the war the difference between their pay as members of the country's armed forces and the average pay they received from the company.

Recruiting Office in Tire Salesroom

Motor truck interests in New York City have started a big organization drive, under the auspices of the Motor Truck Club of America, to aid the War Department in securing 1,360 drivers for forty motor truck trains. A special recruiting office has been opened at the sales office of the U. S. Rubber Co., at 1790 Broadway.

Kelly-Springfield New Plant

The Kelly-Springfield Tire Co. broke ground recently at Cumberland, Md., for its new plant. This plant, it is claimed, will give it a capacity at least four times that of the combined Akron, Wooster and Buffalo plants.

Ajax Opens Branch in Omaha

The Ajax Rubber Co., Inc., has recently opened a branch on Farnum Street near 20th, Omaha, Neb., which is in line with the plan to open branches in the larger cities throughout the country.

W. R. Thropp Sons to Build Shop

The W. R. Thropp Sons Co., Trenton, N. J., manufacturer of rubber mill machinery, will build a one-story machine shop on East State Street.

Ajax Factory Raises Flag

An impressive flag raising was held recently at the plant of the Ajax Rubber Co., Trenton, N. J. The flag, which was donated by the employes, was raised by Louis Destribats, vice president of the company, while the Second Regiment band rendered patriotic airs. Addresses were delivered by John E. Gill, and Harry Heher.

The committee in charge consisted of R. Deousden, chairman; M. Whealan, T. Walsh, J. Milnard, P. Wood, E. Haven, H. Wilkins, C. Dibble, C. Ryden, J. Carr, A. Deblois, James Deblois, Joseph Deblois, H. Tomilson, F. G. Feedman and Joseph Cunningham.

Rubber Company Starts Anew After Fire

A. J. Stephens, owner of the McFall Rubber & Manufacturing Co., has rented part of the G. W. Whitcomb factory building at 1320-26 Chestnut Avenue, Kansas City, Mo., and will soon have the company in full operation under the new firm name of the A. J. Stephens Co. The company, which manufactures motor car and tire accessories, started a year ago with six employes and had over one hundred employes at the time of the recent fire that caused a loss estimated at $40,000 at the plant at 1701 Woodland Avenue.

Beakley Is Firestone's Southwestern Manager

John Beakley of the Firestone Tire & Rubber Co. of Akron, Ohio, has been promoted to the office of the general manager of the company in the southwest, with headquarters at Dallas, Tex.

Hood Lets Contract for Addition

The Hood Rubber Co., Watertown, Mass., has let a contract for a brick and wood, 3-story, 80 x 96-ft. addition to its factory.

Death of James A. Law

James A. Law, for many years a manufacturer of rubber cement, died recently at Maplewood, N. J. He was formerly connected with the Eureka Cement Company of New York City.

Fisk Offers Athletic Field to Government

Rumors of the establishment of a mobilization camp in the vicinity of Springfield, Mass., have caused the Fisk Rubber Co. at Chicopee Falls, to offer the War Department free use of its 45 acre athletic park just outside of Springfield.

Rubber Is Subject for Rotarians

John A. Lambert, treasurer and general manager of the Acme Rubber Company, Trenton, N. J., recently gave an interesting talk on rubber and its growth at the regular weekly meeting and luncheon of the Rotary Club, in that city.

Buckeye May Locate in Steubenville

The Buckeye Puncture Proof Tire Co., now being organized in Steubenville, Ohio, is planning a factory which will be located in that place if a suitable site can be secured. The tire to be made was invented by Morris Baxter of East Liverpool and has a core of rubber and composition.

Big Demand for Rubber

S. P. Woodard, president of the Gillette Rubber Co., Eau Claire, Wis., commenting on the rubber situation says:

"From the best information obtainable it appears that it will take the rubber factories in the countries now at war some two years to resume normal operations. This will mean that a very heavy demand will be made upon the factories of this country to supply rubber goods, not only to this country but to foreign countries during their reconstruction.

"Owing to the fact that the manufacturers of rubber machinery are far behind in their deliveries, it is quite probable that the demand which will be made on the rubber factories now operating, will be in excess of the possible supply.

"There are several other products which are making heavy demands upon the rubber companies, one among which is the rubber heel and sole business. The scarcity of leather and already held up the delivery of thousands of pairs of shoes and the rubber companies are making all possible haste to relieve this situation with rubber soles and heels. This part of the business has proven to be very profitable."

Rubber Costs 17 Cents a Pound

The United States Rubber Company can turn out rubber from its own plantations in Sumatra at a cost of 17 cents a pound, according to Colonel Samuel P. Colt, president of that company.

We have 14,000 employes on our plantation in Sumatra, and all but 200 of those receive a wage of 15c a day. For the same sort of work in rubber forests of Brazil workers receive from $1.50 to $2 a day.

We have about $10,000,000 invested in our far eastern plantations. After this year we shall begin to make money on our investment in plantation rubber lands. About 15 per cent of our crude rubber needs will be taken care of this year from our own plantations. This percentage will be increased to 25 per cent in 1918. In 1921 United States Rubber Company should secure about half of its crude rubber requirements from its own plantations—that is, half of the requirements on the basis of present sales of the company.

N. J. Testing Laboratories Enlarged

The New Jersey Testing Laboratories, 92 to 98 Greenwood Avenue, Montclair, N. J., has completed several buildings, including one devoted to commodious offices. In addition to large facilities for carrying out analysis and research work, these laboratories are prepared to make tests on a semi-commercial basis.

Rairdon Joins Savage Tire Corp.

Percy W. Rairdon, formerly United States vice-consul at Java and sales executive in the Orient for the Singer Sewing Machine Co. and the Standard Oil Co., has joined the Savage Tire Corp., San Diego, Cal., as sales manager.

Fire Truck for National India Rubber

A new station is being prepared at the factory of the National India Rubber Co., Bristol, R. I., for the combination fire truck, which will be moved from the hydraulic engine house on Franklin Street.

Boston Rubber Shoe Plans Addition

The Boston Rubber Shoe Co. is to build a big 4-story brick addition to its plant at Malden, Mass. Plans are now being prepared.

Keystone Tire Co. Leases Larger Quarters

The Keystone Tire & Rubber Co. is now located in the Keystone Building, formerly the home of the White Co., at Sixty-second Street and Broadway, New York.

James Munro Leaves National India Rubber

James Munro, for many years with the National India Rubber Co. at Bristol, R. I., has severed his connection there as foreman of the printing department

News of the Rubber Metropolis

Akron Has Adopted Standard Time—F. A. Seiberling Is Made War Committee Chairman—Large Business Is Being Done—Men Are Drilling—Other Items of Interest

Akron Is Doing Big Business

Special Akron Correspondence

Indications that the Goodyear Tire & Rubber Co. will make 1917 a $100,000,000 year in gross sales are seen in financial reports of the company's business for April, last. Records for the month, according to reports, point to a million-a-year pace, the goal set for 1917 by President F. A. Seiberling.

Sales of The B. F. Goodrich Co., according to reports in financial circles, are running close to the $90,000,000 mark, indicating increase of about $8,000,000 over the earnings of last year.

E. S. Babcox Talks on Advertising

Special Akron Correspondence

E. S. Babcox, advertising manager of the Firestone Tire & Rubber Co., gave a short, practical talk on advertising on May 8 before two classes of students at Ann Arbor, Mich. His address was given in connection with the exhibition of "The Link," a motion picture produced by the Firestone Co. The picture was made for the purpose of impressing upon members of the Firestone organization the value of advertising in merchandising. It has been exhibited in many cities and it will be shown before the Advertising Clubs of the World convention in St. Louis in June.

Red Cross Secures Many Members

Special Akron Correspondence

Hundreds of employes in Akron rubber manufacturing concerns are responding to appeals of boosters in the Red Cross campaign now being conducted here to obtain 15,000 new members for the organization. Each new member pays a fee of one dollar and pledges an equal sum for each ensuing year. All of the large rubber plants are being canvassed. The goal is expected to be reached before May 10.

Akron's Extensive Growth

Special Akron Correspondence

Extensive growth and development of Akron chiefly toward the east and south is due wholly to the immense rubber industry which has fastened itself in these sections of the city. On the east the Goodyear Tire & Rubber Co. in the center from which miles of new streets and residential districts radiate. The same is true toward the south where the Firestone Tire & Rubber Co. is making rapid strides. Both of these concerns are constructing modern homes in newly-opened allotments and are selling them to employes at cost prices.

Goodyear Office Men Are Drilling

Special Akron Correspondence

A military drill class for office men of the Goodyear Tire & Rubber Company, of Akron, Ohio, hae been formed. Hundreds of applications have been sent in and accepted by the drill master. The movement is for general preparedness, linked with the possibility of preparing the men for immediate military service. Many employes of the Goodyear Company have enlisted in the army, navy and marines.

Goodrich Salesman on Visit

George Walton, salesman for The B. F. Goodrich Rubber Co. of Akron, Ohio, is visiting his family at South Bend, Ind.

Akron Has Adopted Eastern Time

Special Akron Correspondence

Eighty thousand employes of Akron rubber manufacturing concerns are going to work one hour earlier each day and are quitting one hour sooner since Eastern standard time has been officially adopted by the city council. Clocks were moved ahead on April 30. They will be turned back one hour on September 30.

Goodyear to Keep Positions for Soldiers

Special Akron Correspondence

In an effort to stimulate military enlistment the Goodyear Tire & Rubber Co. of Akron, has announced that all employes enlisting for duty in any branch of the government service will have their positions kept open until their return at the expiration of their terms of enlistment.

Seiberling Is War Committee Chairman

Special Akron Correspondence

F. A. Seiberling, president of the Goodyear Tire & Rubber Company, of Akron, Ohio, and a director of the Chamber of Commerce of the United States, has been appointed chairman of the new wartime committee of the National Chamber. Mr. Seiberling's committee is expected to investigate and recommend a plan for taking care of dependent families of soldiers who are engaged in the present war.

Arthur H. Leavitt Resigns to Accept Commission

Special Akron Correspondence

Arthur H. Leavitt, assistant sales manager of the motor truck tire department of The B. F. Goodrich Rubber Company, has tendered his resignation to the operating committee in order that he might immediately answer a call to serve as captain in the quartermaster's reserve corps of the army, an appointment which he received by reason of his training at the Plattsburg military training camp last Summer.

Members of the operating committee in accepting the resignation presented Capt. Leavitt with a sword. He departed for Ft. Sam Houston, Tex., where the southern department of the army now has its headquarters.

Giant Tire Has Purchased Findlay Plant

Special Akron Correspondence

The Giant Tire & Rubber Company, of Akron, Ohio, has purchased the plant of the Findlay Tire & Rubber Company, of Findlay, Ohio, and will move to that city taking much equipment from the present plant in Akron, which was partially destroyed by fire recently. The purchase price for the Findlay plant was close to $27,000. About twenty families will move from Akron to Findlay.

Swinehart Issues a Bulletin

Special Akron Correspondence

Publication of a bi-monthly bulletin, containing valuable information concerning activities of all departments, has been adopted by the Swinehart Tire & Rubber Co. for the benefit of its sales force.

A Chain of Tire Stores Is Planned

UNIVERSAL TIRE & RUBBER COMPANY'S STORE AT POUGHKEEPSIE, N. Y.

The chain store idea, which has proved a success in so many lines, is spreading to the retailing of automobile tires and accessories. The Universal Tire & Rubber Co., with executive offices at 120 Broadway, New York, has been formed to operate a series of stores selling automobile tires, tubes and accessories. A few of these stores are already being conducted by this company and others will be opened and operated in localities where a constant and a steady market for accessories has been proved. Towns reached by State roads and traversed by tourists, and towns of fairly large population will be selected first.

The accompanying illustration shows an interior view of the Poughkeepsie, N. Y., store, the first taken over by the company.

It is planned to fit out all stores in an attractive manner with up-to-date equipment. Experts, it is said, will be employed in every branch of the business so that purchasing, stock keeping, collecting and advertising will be operated along most efficient and economical lines. Only standard advertised lines will be carried.

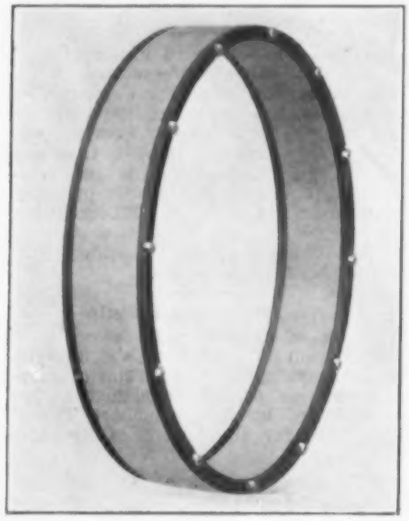
The Activities in the Tire World

The Miller Cushion Pad—The New Amazon Tire—A New True-Thread Valve Tool—The Sterling Cord Tire Co. Has Factory at Salem—News and Items of Interest

The Miller Cushion Pad

Special Akron Correspondence

A new tire adjunct that can be fitted to any motor truck wheel without alteration and which makes road changes of solid rubber tires possible and easy without the help of any special tools, is being manufactured by the Miller Rubber Co., of Akron, O., and is marketed under the name of Miller Cushion Pad.



THE MILLER CUSHION PAD

It consists of an endless band of soft but tough resilient rubber, seven-eighths of an inch thick and as wide as the rim it is required to fit. This band is held between two steel flanges in which twelve bolt holes are drilled to correspond with holes that are molded in the band itself.

When the nut heads of these bolts are tightened, after the pad has been placed in position between the steel base of the solid rubber tire and the rim of the wheel, the rubber of the pad is compressed and bulges out along its center line. The amount of compression, consequently of bulge, depends upon the number of turns given each bolt nut, and the pressure which the compressed pad can thus be made to exert between the rim and the tire base holds the tire securely in place so that it cannot possibly creep on the rim, according to the manufacturer's claims.

Besides providing a quick detachable solid rubber tire that can be applied to standard truck wheels without alteration, this cushion pad increases the resiliency of the tire and thus helps to protect vehicle and load from excessive road vibration.

Alex O. Holroyd Is Dead

Alex. O. Holroyd, who originally came to this country from England with the American Dunlop Tire Co., and who was for years connected with the Hartford Rubber Works Co., latterly in charge of their automobile tire department, died in Daytona, Fla., recently. After leaving the Hartford Rubber Works Co., he went to Columbus, Ohio, with the Midgley Rim Co., and later on left to become connected with a hotel enterprise.

Mr. Seiberling Tells of Goodyear Progress

Special Akron Correspondence

That five years hence a horse will be a curiosity in American cities, is the opinion of F. A. Seiberling, president of the Goodyear Tire & Rubber Co. of Akron. He recently discussed the future of the automobile industry in this country.

"The automobile will be with us forever," said Mr. Seiberling. "It is here because it fills an economic need. There is nothing transitory, nothing ephemeral about the growth of the great automobile industry and its companion, the tire industry.

"It is natural that America cannot always move at top speed. This country cannot always be at the peak. It will take a dip sometime, but when it does, the rubber industry will be less affected than a great many others.

"Two great needs have been emphasized by the war. We have been brought to realize that our entire supply of rubber comes from outside the United States and her territories. Likewise, our long staple cotton comes from other shores. We grow plenty of ordinary cotton in America, and some long staple cotton, but not enough of the latter to meet our needs.

"The Goodyear Tire & Rubber Co. already has taken vigorous action toward protecting its supply of both crude rubber and cotton. We are cultivating rubber plantations in Sumatra and are planting in Arizona 10,000 acres of the finest long staple cotton we could find in the world. In Connecticut, we have our own cotton mills where our cotton is woven into fabric that we use in our products.

"These examples illustrate the long look we are taking into the future of the rubber business. We could grow enough plantation rubber in the Philippines to supply all the needs of the United States. But this is impossible since our laws prevent the importation of coolie labor into United States territory. White men cannot endure the tropical climate of the rubber-growing countries, and if they could the cost would be too great. The principal cost in rubber cultivation is labor expense.

"At present the United States consumes nearly 150,000 tons of crude rubber annually. On a price basis of $1,500 per ton, the United States could gain a business worth $225,000,000 yearly, by cultivating rubber in the Philippines.

"At the Goodyear factory we are working out another problem that many American manufacturers are puzzling over—the housing of labor. We are encouraging our workmen to establish homes. We believe that big problems are worked out better by home owners than by home renters. We like to have married men in our factories. They are stable and willing to accept responsibilities.

"As practical evidence of our viewpoint we are building 1,000 homes to be sold to our workers, who have 20 years to pay for them on the basis of rent. These are not the usual 'company houses,' but are modern homes with architectural individuality, conforming with the latest ideas of home building. Through a special insurance feature title to the property passes to the heirs of the employe in case of his death before the home is fully paid for."

Fisk Opens New Branch

The Fisk Rubber Company of Chicopee Falls, Mass., has opened a branch and service station at 154 W. Rayen Avenue, Youngstown, Ohio.

Sterling Cord Tire Has Salem Factory

The Sterling Cord Tire Co., a $2,000,000 Delaware corporation recently formed, is to occupy the old plant of the American Case & Register Co., Salem, Ohio.

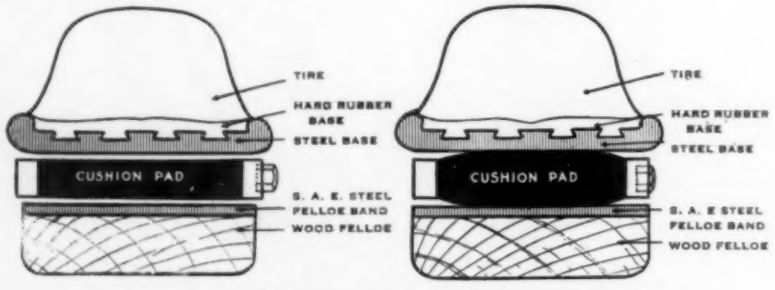
The company, it was announced, has purchased the plant and hopes to be actually turning out tires within a few months. It has already worked out the construction and tested out the tires, which have been made by an Akron concern. There is no metal in these cord tires.

J. H. Christian is president, Frank H. Brice, vice-president, and S. H. Christian is treasurer of the company.

THE MILLER CUSHION PAD

Firestone's New Boston Manager

John T. Clinton, manager of the Buffalo branch of the Firestone Tire & Rubber Co., has been sent to Boston to manage the branch there, succeeding D. C. Swander. Mr. Clinton was temporary manager of the Boston branch for some months following the retirement of Thomas J. Glenn, a year ago.



THE MILLER CUSHION PAD

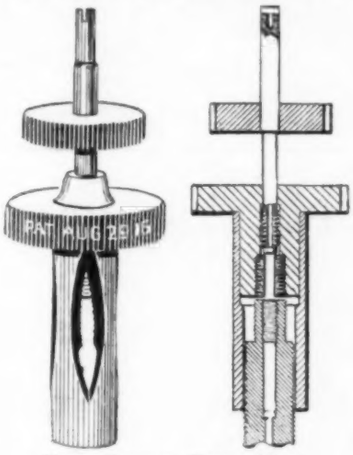
The Fisk Bicycle Clubs

At present over 10,000 boys are enrolled in the Fisk Bicycle Clubs, which are fostered by the Fisk Rubber Co. of Chicopee Falls, Mass. There are no dues or assessments in this organization, the only requisite to membership being that a boy shall own a bicycle.

The national organization is known as the Fisk Bicycle Clubs of America, and a monthly magazine is devoted solely to the interests of these clubs. Belief is expressed that no less than 25,000 boys will be enrolled in these bicycle clubs before the summer is over, judging by the rate at which members are now joining.

The A. & H. True-Thread Valve Tool

The threads of pneumatic tire valves frequently become worn, burred or distorted, making it difficult to insert the valve plunger or to apply the valve cap. The A. & H. Manufacturing Co., 505 West 45th Street, New York City, is marketing a finely made tool for truing these threads. This device which is shown in the accompanying illustration will recut both the internal and the external threads



TRUE THREAD VALVE TOOL

simultaneously or cut either of them separately. It is in the form of a hand wheel with a hub, on the interior of which is a cutter for chasing the cap threads, and on the exterior a sleeve extending beyond the end of the hub, and adapted to fit over the nipple. The hand wheel has a central, cylindrical passage, through which a stem extends and on one end of the stem is a second cutter for chasing the valve threads.

A second hand-wheel on the opposite end of the stem rotates it to effect the cutting. The cap thread cutter is actuated by the other hand wheel. The sleeve centers the cutters automatically and holds them in operating position.

Ehman to Sell Its Own Brands

The Ehman Tire & Rubber Co., La Salle and 27th Streets, Chicago, Ill., which heretofore has manufactured tires for the jobbing trade and mail order houses under private brands, announces that it will discontinue this policy as far as practical and manufacture a tire of superior quality.

When the buildings under construction are completed and the additional machinery installed the plant will more than double its present output of tires and mechanical goods.

Gunsaulus Now with Firestone

P. M. Gunsaulus, buyer and manager of the auto accessory department of the M. W. Savage Factories, Inc., has resigned to accept a position with Firestone Tire & Rubber Co.

Mr. Gunsaulus will have charge of sales promotion work and advertising in the Minneapolis branch of Firestone.

Cassel Is Scranton Manager for Firestone

H. Cassel, formerly manager of the solid tire department at the Philadelphia branch of the Firestone Tire & Rubber Company, has been made manager of the Scranton office.

Marion Opens Springfield, O., Branch

Under the management of Mast Frey, a branch of the Marion Tire and Rubber Co., has been opened in Springfield, Ohio.

Firestone Expands Activities in Detroit

With the production of motor cars in Detroit passing the million mark this year, the Firestone Tire & Rubber Co. finds it necessary to expand its activities in the manufacturers' sales field in the Michigan automobile metropolis.

George A. Richards, one of the company's most aggressive field men, has been appointed special representative in the Detroit territory. Mr. Richards is well-known to the tire and accessory trade of the Middle West.

He has been connected with the sales department of the company for seven years and is thoroughly acquainted with its product and policies. During the past three years he has occupied positions as branch manager at Columbus, Ohio and Pittsburgh, Pa. He opened the company's branch in the latter city and in one year sold $700,000 worth of tires and accessories.

Goodrich Issues Book of Value to Motorists

The 1917 edition of "Rules of the Road," which treats of the commonly accepted highway rules for motor car drivers, has been put into circulation by The B. F. Goodrich Rubber Co.

The booklet declares that 75 per cent of the automobile accidents are due to carelessness or failure to observe the simple rules of the road. "If everybody observed city ordinances, accident liabilities would be reduced," it says among other things.

The new publication calls to the attention of motorists to the fact that they are welcome to the free service of the Goodrich National Touring Bureau regardless of the make of car or tires. Much valuable information concerning the care and repair of tires is also to be found in the pages of this interesting work.

The New Amazon Tire

A new tire that is said to be proof against blow-outs is being manufactured by The Amazon Rubber Co. of Akron, Ohio.

The anti-blowout feature, an extra fabric re-inforcement, or breaker strip, is built into the side walls of the tire.

This side-wall breaker strip circling the tire, is intended to prevent the side walls from over stretching or bulging.

THE NEW AMAZON TIRE

It is built to absorb and distribute bumps and shocks taken on the side walls, the same as the regulation breaker strip does on the face of the tire, and the tire is claimed to stand very brutal treatment and deliver unusually long mileage.

The tire has a very handsome and destinctive appearance, the jet black body having a snow white, one inch, stripe on the side walls.

The tire is hand made, and is made in the non-skid style only.

S. V. Norton Urges Co-operation

Special Akron Correspondence

Addressing the Motor Truck club of Philadelphia, S. V. Norton, truck tire sales manager of the B. F. Goodrich Rubber Co., hit the keynote to successful methods for manufacturers in handling truck drivers to get the maximum of efficiency and economy from the tires as well as the truck.

S. V. NORTON

"The most effective means of securing a truck driver's co-operation is to offer him a reward for his good work," said Mr. Norton. "The truck owner must realize that his driver is doing nine-tenths of his work away from his supervising eye. The driver is, moreover, engaged in work which admittedly is difficult and calls for vigilance, judgment and restraint, qualities, which the worker does not pour into his labor for daily wages."

Fisk Opens Portland, Me., Branch

The Fisk Rubber Co. has opened a branch at 88 Oak street, Portland, Me. E. A. Hall will have entire charge of the distribution of the tires and tubes for both pleasure and service cars in Maine and northern New Hampshire. Tire accessories will also be a part of the stock that will be kept to supply the trade.

Goodyear Promotes Wilson

R. S. Wilson, manager of the service department, has been made manager of the motor truck tire department of the Goodyear Tire and Rubber Company, Akron, Ohio. G. E. Brunner, his assistant, succeeds him as head of the service department.

J. W. Hobbs Represents Lee in New York

J. Wilbur Hobbs, for several years Eastern district representative sales manager of the Goodyear Tire and Rubber Company, and previous to that connected with the Michelin and the Morgan & Wright companies, has taken charge of the New York district interests of the Lee Tire & Rubber Corporation, of Conshohocken, Pa.

Will Make Tires and Tubes

The International India Rubber Corporation, South Bend, Ind., reports that its factory building is now nearly completed.

American Rubber Patents

ISSUED APRIL 24, 1917

1,223,635—To Henry Steinmetts, The Dalles, Ore. Tire Rim.

1,223,689—To John M. Getzendaner, Polo, Ill. Tire Replacer.

1,223,692—To Francis A. Halsey, Philadelphia, Pa. Composition of Matter for Use as a Rubber Substitute.

1,223,724—To Fred C. Otto, Worcester, Mass. Pneumatic Tire.

1,223,725—To Max Cyrus Overman, New York, N. Y. Vehicle Wheel.

1,223,726—To Max Cyrus Overman, New York, N. Y. Mold for Tires.

1,223,727—To Max Cyrus Overman, New York, N. Y. Tire.

1,223,776—To Tossanus Duysens, Maastricht, Netherlands. Armored Pneumatic Tire.

1,223,785—To Oscar J. Hacksbarth, Elmhurst, Ill. Vehicle Wheel.

Bachman, Austin, Tex. Demountable Rim and Felly Band.

1,224,548—To Clarence Inman, Eden, Ont., Can. Automobile Tire Holder particularly adapted to Clincher Tires.

1,224,604—To Waitman Dever Corder, Philippi, W. Va. Garment Supporter.

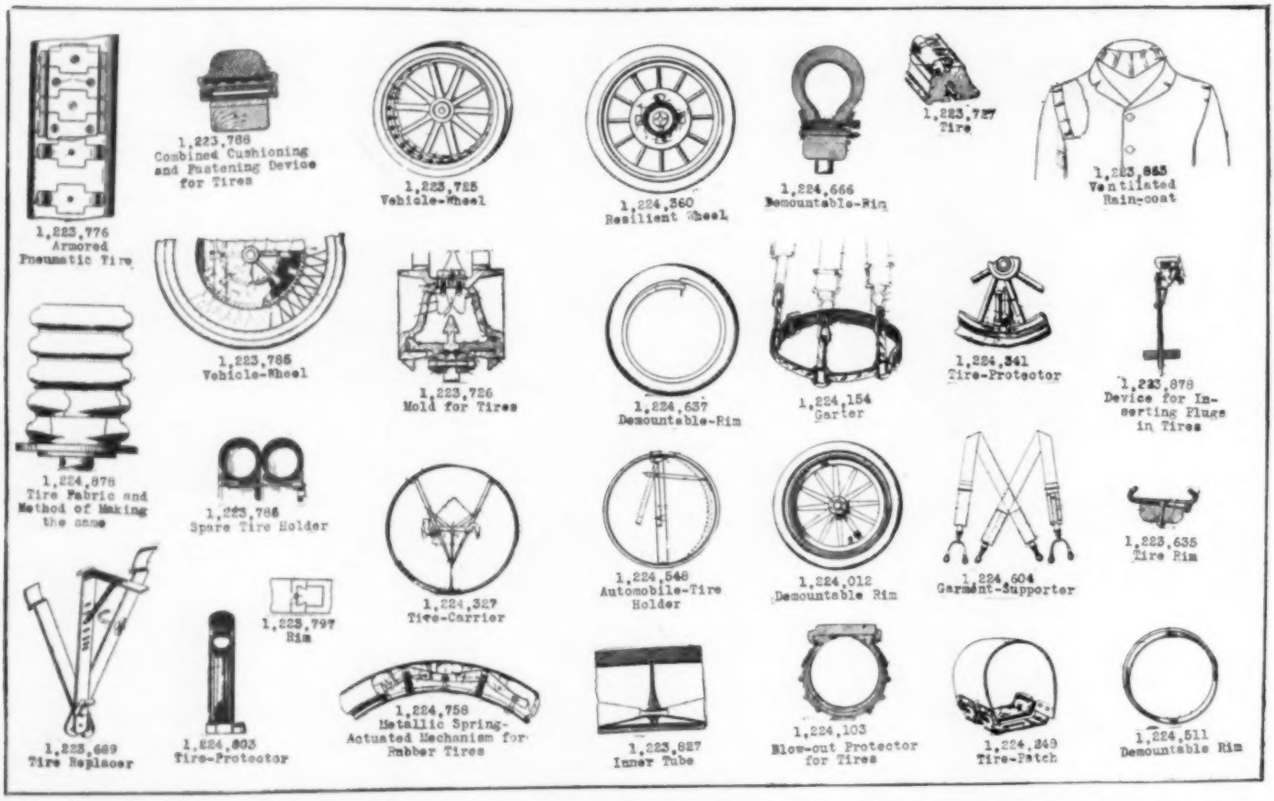
1,224,637—To Earl Henry, Albert Lea, Minn. Demountable Rim.

1,224,666—To Charles Reed Ragsdale, St. Louis, Minn. Demountable Rim.

1,224,758—To Edw. G. Loeser, Roxbury Township, Dane County, Wis., assignor to Cantilever Airless Tire Co., Milwaukee, Wis., a corporation of Wisconsin. Metallic Spring-actuated Mechanism for Rubber Tires.

1,224,803—To Eli S. Stalker, Halstead, Pa. Tire Protector.

1,224,878—To George S. Fisher, Plainfield,



1,223,786—To William P. Hammond, Passaic, N. J. Spare Tire Holder.

1,223,788—To Adelbert Hauschild, Akron, Ohio. Combined Cushioning and Fastening Device for Tires.

1,223,797—To James J. Johnston, Utica, N. Y. Rim.

1,223,827—To Effie May Pearson, Chicago, Ill. Inner Tube to be Used on Automobiles and Other Conveyances.

1,223,863—To Sam Freedman and Fred Freedman, Chelsea, Mass. Ventilated Rain-Coat.

1,223,878—To Harry R. Hust, Trenton, N. J., assignor of one-half to William F. Lennon and Walter D. Lennon, trading as William F. Lennon & Bro., Trenton, N. J. Device for Inserting Plugs in Tires.

1,224,012—To George H. Parks, Lomex, Ill. Demountable Rim.

1,224,103—To Theodore W. Carter, Silver City, N. Mex., assignor of one-half to Moses R. Buchanon, Silver City, N. Mex. Blow-out Protector for Tires.

ISSUED MAY 1, 1917

1,224,154—To Henry Jacob Esser, New Orleans, La. Garter.

1,224,248—To William L. Wayrynen, Lake Norden, S. D. Tire Patch.

1,224,327—To John A. Schmitz, Merricourt, N. D. Tire Carrier.

1,224,341—To Jorge Borges Velis, Habana, Cuba, assignor of one-half to Alejandron Angulo Penzon, Habana, Cuba. Tire Protector.

1,224,360—To Adolph Closz, Webster City, Iowa. Resilient Wheel.

1,224,511—To Charles D. Stephens, Austin, Tex., assignor of one-half to Jos. A. N. J., assignor to The Hartford Rubber Works Co., a corporation of Conn. Tire Fabrics and Method of Making Same.

RECENT INCORPORATIONS

International Rubber Sales Co., Cincinnati, Ohio, $3,000; William L. Hallpike, Roland E. Hunt, Arthur C. Hunt, Herman A. Bayless, John R. Schindel.

Plastic Inlay Rubber Co., Wilmington, Del., to manufacture automobile tires and tubes; $500,000. Incorporators: F. D. Buck, George W. Dillman, M. L. Horty, Wilmington.

Pittsburgh Racine Rubber Co., Pittsburgh, Pa.; $20,000; Cleveland Foster.

Curtis Tire Co., manufacturing tires and rubber goods, $10,000. New York: Harry E. Loveless, Harry Whittaker, Syd Elin.

F. H. Appleton & Son, Inc., Boston, Mass.; $400,000; president, Francis H. Appleton, Brookline, Mass.; treasurer and clerk, F. H. Appleton, Jr., Franklin, Mass.

National Rubber Co., New York, $5,000,000. Incorporators, F. R. Hansell, George H. B. Martin and S. C. Seymour, all of Philadelphia.

Fabri-Cord Tire Company, to manufacture rubber and rubber products; $2,000,000; incorporators: Herbert E. Latter, Norman P. Coffin, Wilmington, Del.; Clement M. Egner, Elkton, Md.

Union Tire Co., to manufacture tires and autombbile supplies; $500,000; incorporators, R. P. Sullivan, H. A. Gross, A. E. Kounts, Pittsburgh, Pa.

Commercial Tire & Rubber Co., manufacturing tires, $1,000. New York: Sydney Bernheim, C. A. Weldon, H. H. Jacobson.

Smooth Rubber Sheeting Co., manufacturing rubberized fabrics, $5,000. New York: Louis B. Silver, Louis Rosenblum, John J. Hanley.

Porter Tire Sales Co., manufacturing rubber tires, $500. New York: Daniel B. Nally, Thomas F. MacMahon, Bailey C. Elliott.

Defender Tire & Rubber Co., Philadelphia, Pa.; $2,000,000; to manufacture, sell and deal in and with rubber tires, tubes, etc.; F. R. Hansell, George H. B. Martin, Philadelphia; S. C. Seymour, Camden, N. J.

Burdick Tire & Rubber Co., Wilmington, Del.: $1,000,000; to manufacture tires and other articles made from rubber; incorporators: Herbert E. Latter, Norman F. Coffin, Clement M. Egner, Wilmington, Del.

The New Idea Double Tire Co., Inc., Rochester, N. Y. $2,500. Incorporators: Ella Rosenbloom and Samuel Rosenbloom, both of 10 Suter Terrace, Rochester, and Henry Johnson, 801 Dewey Avenue, Rochester, N. Y.

Pacific Tire & Rubber Co., Seattle, Wash. $10,000. Incorporators: Ardo M. Peterson, Roy Peterson, Leon E. Peterson.

The Lake City Tire and Supply Co., Cleveland, O. $10,000. Incorporators: H. C. Christy, Jr., A. H. Massey, F. R. Gustafson, M. C. Hough, C. B. Bayly.

Thomas Loughman, New York City; distributor of Dreadnaught tires; $10,000; Thomas Loughman, Michael F. Loughman and John H. O'Brien.

Service Tire & Rubber Co., New York City; manufacturing tires for autos, etc.; $1,000; Sydney Bernheim, C. A. Weldon, and H. H. Jacobson.

Carlisle Cord Tire Co., New York City; manufacturing tires; $550,000; Frank R. Series, George F. Handel, Henry G. Wenzel, Jr.

The Rubber Specialties Co., Uhrichsville, Ohio. Incorporators: O. U. Latto, W. B. Devine, W. B. Bowers, A. B. Offenbacher and J. E. Smith.

Saniton Specialty Co., New York City; manufacturing rubberized goods; capital, $5,000. Incorporators: Herman Stang, Joseph I. Weisner, Nicholas Lawner.

United Heel Co., Philadelphia, Pa.; capital, $200,000. To manufacture shoe heels made of rubber or leather. Incorporators: Wray C. Arnold, Augustine Janvier, Charles A. Donnelly, all of Philadelphia.

The Diamond Rubber Co., Inc., New York City; manufacturing rubber goods; capital, $200,000. Incorporators: H. E. Raymond, Frank C. Van Cleef and Norman E. Oliver.

O'Sullivan Rubber Co., Inc., New York City; manufacturing rubber goods; capital, $200,000. Incorporators: Charles A. Corliss, Robert H. Cory, William P. Tuttle, Jr.

Auto Vulcanizing and Specialty Co., Pittsburgh, Pa.; capital, $50,000. To manufacture and deal in steam vulcanizers for vulcanizing rubber, etc. Incorporators: Wilber A. McCoy, W. I. N. Lofland, Charles N. Jones.

Market of Manufactured Rubber Goods

The entry of the United States into the war is showing its effect on the rubber industry, not through Government orders for rubber goods which have been almost negligible, but by increasing the cost of raw materials of all sorts, and particularly of fabrics.

TIRES

May 1 witnessed further rises in tire prices. The Bergougnan Tire Corp., the De Lion Tire & Rubber Co., the Hardman Tire & Rubber Co., the Hood Rubber Co., and the Keystone Tire & Rubber Co., increased their prices from 10 to 15 per cent on casings, and on an average, 5 per cent on inner tubes.

The tire trade is in a state of uncertainty with indications that there may soon be another general increase due to the constantly growing cost of fabrics, labor and chemicals.

The demand for tires is very brisk, however, and most manufacturers are behind on filling the orders they have in hand. They are refusing to fix prices in forward contracts.

The following are new condensed tire price lists bearing date of May 1, similar to those published in the last two issues of THE RUBBER AGE:

BERGOUGNAN TIRE CORPORATION.

Size.	Plain.	Non-skid.	Red Tubes.
30 x 3	$15.05	$16.30	$3.40
30 x 3½	19.45	22.70	4.00
32 x 3½	22.70	24.90	4.40
33 x 4	31.70	35.40	5.95
34 x 4	33.50	36.70	6.10
34 x 4½	45.35	48.50	7.40
35 x 4½	45.90	49.60	7.50
36 x 4½	46.35	51.10	7.80
36 x 5	54.70	61.40	9.00
37 x 5	56.15	62.75	9.15

HOOD RUBBER CO.

Size.	Plain.	Non-skid.	Red and Gray Tubes.
30 x 3	$19.20	$23.00	$4.00
30 x 3½	25.50	29.50	4.75
32 x 3½	28.65	33.15	4.95
33 x 4	34.75	41.70	6.10
34 x 4	35.65	42.50	6.25
34 x 4½	49.10	56.90	7.95
35 x 4½	50.35	58.10	8.10
36 x 4½	51.35	58.75	8.35
36 x 5	63.25	69.60	9.60
37 x 5	64.25	70.90	9.75

KEYSTONE TIRE & RUBBER CO.

Size.	Plain.	Non-skid.	Gray or Red Tubes.
30 x 3	....	$13.00	$3.10
30 x 3½	....	16.70	3.60
32 x 3½	....	19.75	3.95
31 x 4	....	25.90	4.50
32 x 4	....	26.55	4.70
33 x 4	....	27.65	4.85
34 x 4	....	28.40	5.05

PURITAN TIRES AND TUBES.
[*Hood Rubber Co.*]

Size.	Plain.	Non-skid.	Red and Gray Tubes.
30 x 3	$15.20	$17.20	$3.45
30 x 3½	17.10	19.70	4.05
32 x 3½	19.50	22.75	4.40
33 x 4	29.00	32.90	5.35
34 x 4	29.65	33.50	5.50
34 x 4½	37.95	44.40	7.05
35 x 4½	39.35	45.90	7.15
36 x 4½	40.00	46.50	7.25
36 x 5	48.95	57.40	8.45
37 x 5	49.70	58.50	8.60

MECHANICAL GOODS

Business in rubber mechanical goods can be termed brisk for this season of the year. It consists chiefly in supplying current requirements of regular customers. There have been no large contracts either for civilian or Government needs but large Government orders are expected on proposals that have been made to the Quartermaster General's Office for packing, belting and hose.

SOLES AND HEELS

The demand for soles and heels appears to be unlimited and all manufacturers producing these articles are working full time without being able to "catch-up" on their deliveries.

FOOTWEAR

Rubber footwear manufacturers are working night and day to give satisfaction to their customers who are calling upon them as never before, owing to the scarcity and high cost of leather and due also to the fact that rubber footwear has been perfected to the point where many consider it superior to the leather kind from almost every point of view.

Manufacturers of rubber footwear are having to contend with all sorts of difficulties including shortage of skilled labor, of raw materials and of means of getting the latter to the mills and of delivering the finished goods to customers.

Railroad congestion has been forcing some manufacturers to use motor trucks to bring raw materials to their mills and to deliver their products.

In spite of all these difficulties manufacturers generally believe they will be able to satisfy a large part of the civilian requirements and at the same time fill any of the Government orders they expect to receive.

DRUGGISTS' SUNDRIES

The selling season in druggists' sundries will begin to open next month and it is expected to be a record one, judging from the activity that has characterized the off-season. The prospects of the United States organizing a huge military force is another factor that points to a busy season.

Soldiers going to Europe will need all kinds of druggists' sundries and particularly water bottles, air cushions and the like. Further, it is believed that the Government will soon start placing many orders for articles produced by rubber sundries manufacturers.

The Fabric Market

NEW YORK, May 11, 1916.

After a decline on May 9, raw cotton prices have swung upward again due to peace talk, greater activity in Liverpool and reports of unreasonably cold weather in the South, but, as conditons are shaping themselves, it does not appear that any substantial increase in the prices of this commodity will be sustained, for reports from all countries point to the conclusion that the world is nearing the limit of its ability to withstand advancing commodity prices.

The general feeling, though not always openly expressed, is that there will not be any appreciable future increase in the prices of raw cotton. As a result of this feeling holders are gradually letting go and, while low temperatures throughout the cotton belt have a tendency to advance the raw cotton market, advancing prices have been checked because of increased selling.

At the ending here the tone was steady at a net advance of 18 to 22 points.

The following are the highest and lowest prices of yesterday, also the closing of a year ago:

	May 19, 1917. High.	Low.	May 10, 1916. Closing.
May	19.62	19.47	12.85@12.88
June	....	....	12.88 bid
July	19.54	19.35	12.95@12.97
August	19.30	19.30	13.05@13.08
September	....	....	13.11@13.12
October	18.73	18.58	13.15@13.16
November	....	....	13.20 bid
December	18.80	18.65	13.33@13.34
January	18.78	18.71	13.37@13.38
March	18.92	18.91	13.53@13.54

EGYPTIAN COTTON

According to a report received by mail from Alexandria and covering the week ended April 5, 1917, that period was one of the most excited of the season, prices at the close showing an advance of $3 for old crop and $1.50 for new crop. New records were attained, May being transacted as high as $46.90. One of the principal reasons for prices being pushed up so high was the reduced estimate of the old crop which, it is now generally admitted will barely reach 5¼ million cantars; a good deal of it, about 40 per cent being Good Fair.

In the actual stock in Alexandria of about one million cantars, the good qualities are hardly represented, and the holders of the remaining lots are asking fantastic prices; for the best available Sakellarides $60 has been offered. In addition to the reduced crop estimate and scarcity of good quality, the steadiness of American markets and the substantial advance of Egyptians in Liverpool has also helped the rise of prices.

There are so far no evident prospects for a settlement of the shipping question with America, although efforts are being made in every direction. There is also a shortage for freight for the Far East, and exports from Egypt for that direction have been nil for some weeks.

Since our last report the position as regards sowing for the 1917 crop has developed as follows:

Middle Delta, over 75 per cent of the area has now been sown.

North Delta, the majority of the cultivators have started sowing; 20 per cent is the area sown so far.

Owing to high temperatures, "sore shin" fungus attacks have been stopped everywhere. The first real leaf of the plant is now formed and in some cases two leaves are showing. Resowings are in general in larger proportions than last year.

SEA ISLAND COTTON

There have been heavy rainfalls in South Carolina and Georgia. These remove the anxiety that has been caused by the need of rain in the Eastern belt, but many believe these rainfals have been too heavy. Cold weather that has prevailed in both of these States has been detrimental to the planting and to the growth of cotton. Many say that the outlook for Sea Island is the poorest at this time in recent years.

At Savannah there has been large sales of Sea Island cotton at new high prices. The stock there is unusually small for this time of the year, and 75 cents is being paid for Sea Island Cotton.

YARNS

Cotton yarns continue to be generally quiet. The majority of spinners are covered to capacity for many months to come and they are not disposed to take contracts for deliveries too far ahead.

ALEXANDRIA STATISTICS FOR THE WEEK ENDING APRIL 5, 1917.

	Arrivals Cantars	Exports (Bales) England	Con'nt	America	Exports Cantars	Stock Cantars
This week	44,948	8,113	5,833	.....	106,674	*971,966
Same week 1916	17,754	3,449	3,170	1,976	65,054	640,369
Same week 1915	60,508	5,184	5,312	5,497	121,569	1,774,053
Since Sept. 1, 1916	4,698,599	282,239	96,195	112,709	3,751,633	.....
Same time 1915	4,461,606	289,009	158,164	172,893	4,711,567	.....
Same time 1914	5,908,245	289,664	232,029	124,385	4,900,492	.....

* 68,000 Cantars to Japan deducted.

Only a very restricted amount of business can be placed on either Sea Island or Egyptians and spinners who are able to accept such contracts are getting very fancy prices.

The situation in these yarns promises to become serious, but manufacturers of tire fabrics are solving much of the difficulty by using long domestic peelers, and it is reported that fabrics containing these are showing very good qualities. As a result prices of yarns of this character are increasing steadily, from 95 cents to $1.10 being asked for certain counts of combed peeler yarns.

FABRICS

Government orders in both cotton and woolen fabrics are beginning to occupy much attention. Big orders have been received from this source for cotton goods including sheetings, ducks and blankets. Orders aggregating $50,000,000 are said to have been placed with Fall River mills, which have advanced wages 10 per cent, making about 40 per cent increase within a year or so.

TIRE FABRICS

The market for tire fabrics is quiet but very firm and almost every indication points to further rises in spite of the restraining effect exercised by the increasing use of long domestic staples which manufacturers of tire fabrics are using as substitutes for Egyptian and Sea Island cottons which can only be had in much limited quantities and at prices that are threatening to become almost prohibitive.

HOSE AND BELTING FABRICS

Though the Government has not placed any orders for hose and belting fabrics, they are being affected indirectly by the requirements of the Army and Navy. Many looms that were formerly engaged in making these fabrics have been taken over for making materials needed for the Army we expect to have.

DRILLS, SHEETINGS AND OSNABURGS

These fabrics are in very heavy demand in spite of the exceptionally high prices they are commanding. Government requirements are becoming a great factor. With civilian and Government orders the mills have their hands full and in many instances are engaged for many months to come.

GARMENT CLOTH

Government requirements for garment cloth are becoming clearly defined and persons in a positon to know believe that there will be serious interference with the filling of civilian orders. It is said that at the present time almost $30,000,000 of Government orders have been placed with the woolen and worsted mills. Quotations are still being withheld.

BURLAPS

The burlap market continues to be very brisk but the scarcity of supplies is making it necessary to turn down many offers. Most all of the burlap in the United States and that afloat for this country has been sold with the result that very little is available and prices are going higher every day. These prices cannot be said to be fancy, for the cost of getting burlap out of India and transporting it to this country is almost prohibitive.

NEW YORK QUOTATIONS

MAY 11, 1917.

TIRE FABRICS.

17¼-ounce Sea Island, combed,	sq. yd.	$1.40@1.60
17¼-ounce Egyptian, combed		1.35@1.40
17¼-ounce Egyptian, carded		1.30@1.40
17¼-ounce Peelers, carded		0.75@0.80
17¼-ounce Peelers, combed		0.95@1.00
American Carded Staple, 12 to 20 yarn, per lb. (pound basis)		.55
American Carded Staple, 8 to 10 yarn, per lb. (pound basis)		.45

MECHANICAL DUCKS

Hose (spot)	lb.	.40
Hose (future)		.39
Belting (spot)		.43
Belting (future)		.40

DUCKS

Single Filling (pound basis)	lb.	$ .40
Double Filling (pound basis)		.50

DRILLS

37-inch 2.35-yard	yd.	.15½
37-inch 2.75-yard		.13¼
37-inch 3.00-yard		.12
37-inch 3.25-yard		.11½
37-inch 3.50-yard		.10¾
37-inch 3.95-yard		.09¾
38-inch 2.00-yard Southern	lb.	.40
38-inch 2.00-yard Northern		.43
40-inch 2.47-yard Southern		.16
40-inch 2.47-yard Northern		.18
52-inch 1.90-yard Southern		.21
52-inch 1.90-yard Northern		.23
52-inch 1.95-yard Southern		.19½
52-inch 1.95-yard Northern		.19½
60-inch 1.52-yard Southern		.26¼
60-inch 1.52-yard Northern		.27

SHEETINGS

40-inch 2.35-yard	yd.	.15
40-inch 2.50-yard		.14
40-inch 2.85-yard		.13
40-inch 3.00-yard		.12
40-inch 3.25-yard		.11¼
40-inch 3.60-yard		.11¼
40-inch 3.75-yard		.10¼
40-inch 4.25-yard		.08⅞

TWILLS FOR PROOFING

37-inch 2.85-yard	yd.	$ .14½
37-inch 2.35-yard		.16¼
37-inch 2.10-yard		.18½

COTTON STOCKINETTES
(52 inch.)

E—11½-ounce	yard	.70
A—11 -ounce		.50

BURLAPS
(Carload lots.)

40-inch 7½-ounce	per 100 yards	$8.00
40-inch 8 -ounce		8.25
40-inch 10 -ounce		10.30
40-inch 10½-ounce		10.50

Chemicals and Compounding Materials

NEW YORK, May 11, 1917.

With the outlook for any weakness in basic materials remote, under present abnormal conditions, manufacturers and dealers in chemicals, etc., were not free sellers and the undertone of the market was firm in nearly all quarters. A good inquiry was reported for third and last quarter deliveries, but buyers appeared to be reluctant to contract further ahead. During the last fortnight higher prices were named for acetone, aniline oil, mineral blacks, ultramarine blues, carbon bisulphide and tetrachloride, hexamethylene, lead pigments, corn oil, linseed oil, rapeseed oil and paraffine wax. Easier prices obtained for antimony metal, betanapthol, and shellac. The weakness in spot antimony had no influence upon the market for sulphuret.

ANTIMONY

The easier position of spot antimony had no influence upon sellers of sulphuret. Importers and domestic producers of sulphuret appear to be well sold up and firm prices were named for all grades. Red sulphuret closed unchanged at 25 @ 26c., with the golden at 28 @ 30c. and the crimson at 52 @ 55c. per pound. Antimony metal closed nominally at 25 @ 26c. per pound, spot delivery. Needle antimony held at 16 @ 18c. per pound, according to seller.

ANILINE OIL

Aniline oil closed strong, producers asking from 30c. to 32c. per pound. Several sellers claim that they have been able to secure 32c. for their product without trouble. The strength is due to the active export buying, the bulk of the spot offerings being cleaned up.

BENZOL

Stocks of pure benzol for spot delivery are moderate and with business fairly active a firm undertone prevails. Prices, however, closed unchanged at 55 @ 60c. per gallon, the inside figure obtaining for round lots, bulk basis, f.o.b. plant.

COLORS

Owing to the higher cost of basic materials and the sold up condition of most producers, prices for ultramarine blue were raised to 25 @ 45c. per pound, according to quality. Blacks were offered sparingly and at more or less nominal prices.

SULPHUR

A strong market obtained for sulphur, both crude and refined. The delay in securing shipments of crude from the mines, coupled with the heavy domestic and export demands, tends to further strengthen the market for refined. Leading producers report the market for crude on spot as nominal. The price at the mines is $35 per ton. Refined sulphur held on the basis of $2.85 per 100 pounds for the flour, in car lots, prompt shipment.

LEAD PIGMENTS

The lead pigments were advanced ½c. per pound, in view of the growing scarcity and high position of pig lead. Red oxide of lead closed at 11½ @ 11¾c., with sublimed blue at 9½ @ 10c. and standard white at 10 @ 10½c. Litharge closed at 11½ @ 11¾c. per pound. Orange mineral was advanced to 13½ @ 14c.

ZINCS

With the spelter market unsettled, holding around 9½c. per pound, consumers look for easier prices for zinc oxide for forward delivery. Producers still quote on the basis of 9¾c. for the American process, January-June shipment, in 50-ton lots. American process for spot was offered by second-hands around 12c. per pound.

Prices Current for Chemicals, Fillers, Colors, etc.

Acetone	lb.	.29½	@	.30½
Acids, Acetic, 28%	lb.	.04½	@	.05
Carbolic, C. P.	lb.	.42	@	.44
Cresylic, 95%	gal.	1.05	@	1.10
Muriatic, 20 deg.	lb.	.01¾	@	.02
Muriatic, 22 deg.	lb.	.02	@	.02½
Nitric, 36 deg.	lb.	.05¾	@	.06
Nitric, 40 deg.	lb.	.06½	@	.06¾
Sulphuric, 60 deg.	lb.	.01	@	.01½
Tartaric, crystals.	lb.	.76	@	.80
Aniline oil	lb.	.30	@	.32
Antimony, metal, spot	lb.	.25	@	.27
Oxide	lb.	.18	@	.20
Sulphuret, red	lb.	.25	@	.26
Sulphuret, golden	lb.	.28	@	.30
Sulphuret crimson	lb.	.52	@	.55
Asbestos	ton	22.00	@	45.00
Asphaltum, Egyptian	lb.	.20	@	.25
Domestic	ton	18.00	@	25.00
Barium sulphate, technical	lb.	.04¾	@	.05¾
Chloride	lb.	.04⅞	@	.05¼
Barytes, prime white imported	ton	38.00	@	40.00
white, domestic	ton	28.00	@	32.00
off color, domestic	ton	22.00	@	24.00
Benzol, pure	gal.	.55	@	.60
Peta-naphthal, sublimed	lb.	.75	@	.80
unsublimed	lb.	.70	@	.75
Blacks, Drop	lb.	.07	@	.12
Ivory	lb.	.16	@	.30
Carbon gas	lb.	.22	@	.32
Lampblack	lb.	.14	@	.20
Mineral blacks	ton	25.00	@	30.00
Blues, Prussian	lb.	.85	@	1.50
Soluble	lb.	1.40	@	1.60
Ultramarine	lb.	.25	@	.42
Browns, Sienna, Italian, burnt and powdered	lb.	.06	@	.10
burnt, lump	lb.	.04¼	@	.06
American, burnt and powdered	lb.	.02	@	.03
Umber, Turkey, burnt, powdered	lb.	.04	@	.05
American, burnt	lb.	.03	@	.03½
Cadmium sulphide, yellow	lb.	3.70	@	3.80

Carbon bisulphide, bulk..lb.	.06½	@	.07½
tetrachloride, drums.lb.	.17	@	.17½
Caustic Soda, 76 @ 78%..lb.	.05¾	@	.06
Chalk, precipitated, light.lb.	.04½	@	.04¾
heavy.....lb.	.03¾	@	.04¼
China clay, domestic...ton	20.00	@	25.00
imported ...ton	30.00	@	40.00
Fossil flour .....lb.	.06	@	.10
Gilsonite .....ton	40.00	@	45.00
Glue, extra white.....lb.	.26	@	.35
medium .....lb.	.23	@	.25
low grade .....lb.	.20	@	.22
Glycerine, C. P. (drums).lb.	.56½	@	.57
Graphite, flake (bbl.)...lb.	.25	@	.—
powdered (bbl.)..lb.	.10	@	.—
Green, chrome .....lb.	.32	@	.50
Ground glass (fine).....lb.	.02½	@	.—
Hexamethylene .....lb.	.75	@	.80
Indian red, standard....lb.	.08	@	.10
Infusorial earth, powd'd.ton	60.00	@	—
bolted ....ton	70.00	@	—
Iron oxide, red, reduced grades .....lb.	.04	@	.05
red, pure, bright..lb.	.12	@	.14
Lead, red oxide of.....lb.	.11½	@	.12
sublimed blue .....lb.	.09½	@	.10
white, basic carbonate.lb.	.10	@	.10½
white, basic sulphate.lb.	.09½	@	.10½
Lime, flour... .....lb.	.01½	@	.01¾
Litharge .....lb.	.11	@	.11½
English .....lb.	.11½	@	.12½
sublimed .....lb.	.10¼	@	.10¾
Lithopone, domestic ....lb.	.06¼	@	.06¾
Magnesia, carbonate ....lb.	.12	@	.14
calcined, heavy...lb.	.12	@	.14
calcined light.....lb.	.65	@	.70
Magnesite, calcined, pwd.ton	65.00	@	70.00
Mica, powdered .....lb.	.03¾	@	.05
Mineral rubber (asphaltum base) ....ton	40.00	@	60.00
Naphtha, motor gasolene (steel bbls.)...gal.	.24	@	.—
68 @ 70 degrees (steel bbls.)...gal.	.30	@	.—
70 @ 72 degrees (steel bbls.)...gal.	.31	@	.—
73 @ 76 degrees (steel bbls.)...gal.	.33	@	.—
machine(wood bbls.)gal	.41	@	.—
Oil corn, crude.....cwt.	15.75	@	16.00
corn, refined.....cwt.	16.76	@	16.91
linseed (bbl) .....gal.	1.27	@	.—
palm, Bonny .....lb.	.14¾	@	.15¼
pine, yellow .....gal.	.54	@	.56
rapeseed, refined ...gal.	1.35	@	.—
rapeseed, blown ..gal.	1.40	@	.—
rosin, first rectified.gal.	.38	@	.40
tar (commercial)..gal.	.22	@	.—
Orange mineral, American.lb.	.13½	@	.14
imported....lb.	.16	@	.20
Petrolatum, bbls., amber.lb.	.04	@	.04½
pale yellow .....lb.	.04½	@	.04¾
Pine tar .....bbl.	9.25	@	9.50
Pitch .....bbl.	4.25	@	4.75
Plaster of paris.....lb.	1.50	@	1.70
Rosin (common to good), @ 280 lbs.....bbl.	6.20	@	6.30
Rotten stone, powdered..lb.	.02½	@	.04
Rubber substitute, black.lb.	.09½	@	.12½
white .....lb.	.14	@	.18
brown ....lb.	.13	@	.17
Shellac, fine orange.....lb.	.61	@	.62
T. N. .....lb.	.56	@	.—
bleached, commercial.lb.	.54	@	.55
bleached, bone dry..lb.	.66	@	.67
Silex (silica) .....ton	24.00	@	34.00
Soapstone, powdered....ton	14.00	@	20.00
Starch, corn, powdered..lb.	.04¾	@	.05
Sulphur, crude .....ton	*45.00	@	—
Sulphur, roll, per 100 lbs. in .....bbls.	2.70	@	3.00
flour	2.85	@	3.25
flowers	3.05	@	3.45
Talc, American .....ton	13.00	@	18.00
French .....lb.	.15	@	.22
Toluol, pure, in drums..gal.	2.00	@	2.10
Tripolite earth .....ton	60.00	@	65.00
Turpentine, pure gum spirits .....gal.	.50	@	.51
wood .....gal.	.45	@	.47
Venice, artificial..gal.	.12	@	.13
Vermilion, Chinese.....lb.	2.50	@	2.75
English .....lb.	2.25	@	2.50
Wax, beeswax, crude yel.lb.	.42½	@	.44½
ceresin, white .....lb.	.18	@	.22
carnauba, No. 3.....lb.	.36	@	.37
ozokerite, black .....lb.	*.60	@	.70
green .....lb.	*.80	@	.90
montan .....lb.	*.30	@	.40
paraffin, refined 118/120 m. p. (cases)...lb.	.08¼	@	.08½
123/125 m. p. (cases)lb.	.08¾	@	.09
128/130 m. p. (cases)lb.	.09½	@	.09¾
133/136 m. p. (cases)lb.	.10¾	@	.11
crude, 117/119 m. p. (bbls.) .....lb.	.07	@	.07½
yellow, 124/126 m. p. (bbls.) .....lb.	.07½	@	.08
Whiting, commercial...cwt.	.95	@	1.10
Paris, white, American .....cwt.	1.25	@	—
English cliffstone.cwt.	1.50	@	—
Yellow ochre .....lb.	.03	@	.05
chrome, c. p. ....lb.	.24	@	.28
Zinc oxide, American process, horsehead brand..lb.	†.09¾	@	.09⅞
selected .....lb.	†.10¼	@	.—
"XX red".....lb.	†.09¾	@	.10
French process, green seal .....lb.	.15½	@	.16
red seal.....lb.	.15	@	.15½
white seal.....lb.	.16	@	.16½
Zinc substitutes .....ton	30.00	@	35.00
Zinc sulphide, pure.....lb.	.07	@	.—

*Nominal.
†Contract prices.

Crude Rubber Market

NEW YORK, May 11, 1917.

The news that the Government has under consideration the proposition of taxing crude rubber 10 per cent caused quite a stir in the trade, but failed to materially influence prices. That a tax would enhance the value of rubber delivered to consumers was not open to disputation, but the question confronting the importers was—has this action already been discounted? As a hard fight will be put up by the various industries affected it is hoped in many quarters that the bill will be modified. Talk of taxing rubber has been current for some time and importers made ample provisions for such a move in all of their contracts. The contracts are so worded that buyers will have to stand all additional charges in the way of export or import taxes.

Owing to the continued reduction in ocean tonnage, which may ultimately result in a curtailment in shipments, the undertone of the market at the close was firm. A week previous there was some fair buying of plantation rubber for spot and forward delivery, but lately business fell away, due chiefly to the developments in Washington. A 10 per cent tax means a great deal to manufacturers and many of them are now inclined to hold off for a lower market which would, to some extent, offset the revenue measure.

According to information from trustworthy sources the world's supply of crude rubber is ample for present needs, so this question is not troubling operators. Any adverse developments in the shipping situation, however, are immediately reflected in the market. The British Government has again withdrawn a large tonnage from the Far East and freights were subsequently marked up to the equivalent of 1c. per pound on rubber.

In London prices have been unsettled under larger offerings and the unwillingness of operators to take hazardous risks. First latex pale crepe and ribbed smoked sheets closed to-day at 36¼d. per pound, prompt shipment.

Compared with a fortnight ago the local market for plantation rubber shows an advance of 1c. per pound for all positions. First latex is quoted on the spot at 83 @ 83½c., with May-June at 81¾ @ 82c. and July-December at 78½c. Ribbed smoked sheets on the spot was offered at 83½c., while on July-December contracts 78½c. could have been done.

Brazilian descriptions were inactive and prices, compared with two weeks ago, were a shade lower. Para up-river fine on spot was offered at 75c., with the same grade for May-June shipment from Brazil available at 74 @ 74½c. per pound. Up-river coarse closed at 50½c., spot and nearby delivery. Islands fine was offered sparingly and the price of 73c. was more or less nominal.

Centrals were firm despite the fact that the ideas of buyers were from 1 to 2c. under current prices. Prime Corinto was firm at 51c., with Esmeralda at 50c. Guayule was in scanty supply and prices were merely nominal around 43 @ 44c. per pound. Pontianac was strong in view of the rise in freights and 12c. was asked on forward shipments. African descriptions were quiet and featureless.

Current Prices

	Spot.	May-June.	July-Dec.
Para—Up-river fine.....lb.	75	74½	..
Up-river medium	71	70½	..
Up-river coarse	51	50½	..
Caucho ball	51	50½	..
Islands fine	73	..	..
Islands coarse	34	33½	..
Cameta	37	36½	..
Madeira fine	77	76	..
Ceylons-Smoked sheets, ribbed	83½	82	78½
Smoked sheets, plain....	82	81	77½
First latex pale crepe....	83	81¾	78½
Amber crepe	82	81	77½
Clean brown crepe.....	79	77	73½
Centrals—Corinto, prime...	51	..	..
Esmeralda, prime	50	..	..
Mexican scrap	49½	..	..
Balata, sheets	65	..	..
Balata, block	56	..	..
Guayule	43	..	..
Africans—Rio Nunez, string.*	67	..	..
Massai, red.....	*55	..	..
East Indian Pontianak.....	12	12	..
Palembang	12¼	12¼	..

* Nominal.

Scrap Rubber Market

A firmer tone is noticeable in the scrap rubber market, but dealings continue to be wholly routine in character. The following prices are quoted by middlemen to consumers:

Domestic scrap—			
Boots and shoes, No. 1, per lb..	8⅞	@	9¼
Trimmed arctics.....	7	@	7⅛
Bicycle tires.....	4⅞	@	5
Auto tires.....	6¾	@	6⅞
Solid tires.....	6¼	@	6⅝
No. 1 inner tubes.....	26½	@	27½
No. 2 inner tubes.....	12¾	@	13¼
Hose	1¾	@	2
Red tubes.....	12¾	@	13¼
Black rubber.....	3	@	4
Foreign scrap—			
Boots and shoes, No. 1.....	8½	@	8¾
Auto tires.....	6	@	6¼
White mixed.....	8	@	8¼
Red mixed.....	6¾	@	6⅝
Airbrakes	3	@	4

Plantation Yield of French Indo-China

Production of plantation rubber is rapidly increasing in French Indo-China. The exports from Saigon in 1913 were valued at $128,752. The 1914 figures showed 20 per cent increase, to $158,328, while last year the increase was almost 100 per cent, the figures being $315,075.

The first exports were three tons in 1908. In 1915, 357 tons were exported. From January 1 to August 22, 1916, 312 tons were exported, against 133 tons for the corresponding period of 1915. The exportation of rubber to foreign countries was forbidden in January, 1915, since which time the entire export has gone to France. The steady increase is likely to continue for a dozen or twenty years, while new areas are being planted and present trees come into productive bearing.

New Garment Factory in Amsterdam

A factory five stories high, 262 feet long, and 58 feet wide has been completed and has begun operations in Amsterdam, Holland. It will manufacture rubber raincoats, waterproof cloth, dress shields and certain classes of garments for women. The plant begins work with a large stock of raw materials which, it is hoped, will enable operations to continue without interruption until the difficulties caused by the war have ended. The establishment is called the Hollandia Factories, and is operated by the firm of Kattenburg & Company.

Oriental Business Is Increasing

J. G. Budd of the export department of the Fisk Rubber Co. has just returned from a trip through the Orient and Antipodes and reports the tire business shows a material increase.

I shall be glad to discuss the building of Dirigible Balloons ("Blimps") with any Rubber Company on a profit-sharing basis.

A. ROY KNABENSHUE
140 West 42nd St., New York City

News of the Tire Dealers

C. M. WILCOX will open a new automobile supply and tire shop on South Main St., Princeton, Ill. A complete line of accessories, tires, tubes, etc., will be carried, and a vulcanizing department modernly equipped will be maintained.

THE MORRIS STEAM VULCANIZING PLANT, Morris, Ill., has been purchased by Harry and Richard Bishop.

THE DELMARVIA GARAGE & TIRE SHOP, 717 Shipley St., Wilmington, Del., has secured the agency for Cleveland tires and will also handle Summit and Hamilton tires. A vulcanizing plant will be maintained.

The PEERLESS RUBBER & TIRE CO., Toledo, O., changed its name to the Peerless Rubber Products Co. and incorporated for $10,000.

ROY G. PIERCE, 672 Ohio Street, Terre Haute, Ind., has taken on the agency for the Goodyear Tire and Rubber Co.

The PACIFIC TIRE AND RUBBER COMPANY of Los Angeles, Cal., will engage in the business of manufacturing and selling automobile tires and other rubber goods.

THE D. F. SEGELKE RUBBER COMPANY has leased the store 901 Broad street, Newark, N. J.

THE SAVAGE TIRE & RUBBER CO., Fond du Lac, Wis., composed of W. L. Seeley and Josephy Kugler, has opened for business at 148 South Main street. They will will handle tires and accessories. A specialty will be made of vulcanizing.

THE KROUGH-THOMAS AUTO CO., Cameron, Tex., will carry a full line of tires, tubes, and accessories.

ROY WRIGHT, Mahomet, Ill., has leased space in the Masonic building for a vulcanizing and tire shop.

Work will soon begin on the construction of a three-story building on Michigan street, Grand Rapids, Mich., to be occupied entirely by the MICHIGAN TIRE COMPANY as a show room, warehouse and service rooms.

THE BRADSHAW TIRE & RUBBER CO., Chicago, Ill., has been appointed local distributor for Globe tires.

THE BUTTS & ORDWAY CO., one of the oldest hardware concerns in Boston, Mass., has opened a special department for the handling of motor accessories, tires and supplies.

ERNEST MCLANE AND ALTON T. BUFFINGTON have opened an automobile tire concern at 77 Granite St., Fall River, Mass.

The ELLERT RUBBER COMPANY, 1307 Sutter St., San Francisco, Cal., has been organized by F. L. Ellert, and will handle the Goodrich safety tread and Silvertown cord tires, and Howe tubes and motor supplies. A vulcanizing plant will also be maintained.

THE EVERETT AUTO SUPPLY COMPANY, Brooklyn, N. Y., has been appointed agent for the Amazon tires.

FERRY & KIRSLING AUTO CO., Stevens Point, Wis., will handle Goodyear tires.

STEVE, THE TIRE MAN, INC., Philadelphia, Pa., will have the local agency for Amazon tires.

The ALLING RUBBER COMPANY, Watertown, N. Y., has increased its line of tires, which now includes the United States, Dayton, Hood and Vitalic tires.

The GRAY RUBBER CO., Dallas, Tex., handling Hood and Puritan tires, has taken a lease on a store at 1926 Main street.

RALPH E. BECKER, Buffalo, N. Y., will act as local distributor for Amazon tires.

PERRY BONDY SERVICE STATION has been opened at Huron and Jefferson Aves., Toledo, Ohio, by Perry Bondy. He will also handle tires, supplies and will maintain a vulcanizing service.

F. S. GEMBERLING, 1309 Sutter St., San Francisco, Cal., has opened a tire shop and vulcanizing plant.

L. A. DENNERT AND GEORGE P. PAINE will operate a vulcanizing plant at Elkhart, Ind.

EDWARD GRAYVILL, Dixon, Ill., who has the agency for Miller tires, is now established in a new location at 92 Galena avenue. In addition to tires he will also do vulcanizing work.

THE ELGIN MOTOR CAR COMPANY will open a repair and storage business at 829 Minnesota Avenue, Kansas City, Kan. The company will handle U. S. tires. C. J. Lowry will be in charge of the establishment.

WALTER BECKWITH will open an automobile accessories store on South Main street, Maquoketa, Iowa. The quarters will be rearranged and a vulcanizing plant will be installed.

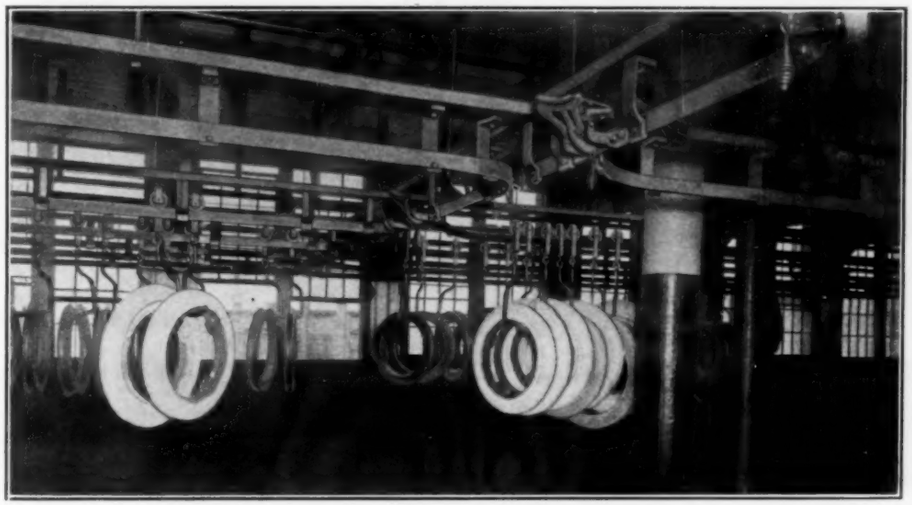
SCHUETTE & TOUPIN HARDWARE CO., Hancock, Mich., will open a garage and repair-shop and will also do vulcanizing. They will carry a full line of automobile, motorcycle and bicycle tires.

The BELL 2-IN-1 TIRE CO., Richmond, Va., owing to increasing business has removed to a new building at 600 West Broad street.

H. W. MCFADDEN, recently of the Buffalo, N. Y., branch of the Firestone Tire & Rubber Company has assumed charge of the tire end of the business of the Harris Tire Company, Savannah, Ga., with which he was associated seven years ago.

THE KEYSTONE TIRE & RUBBER COMPANY, New York City, has secured large quarters at Broadway and Sixty-third street.

J. DUNCAN CO.



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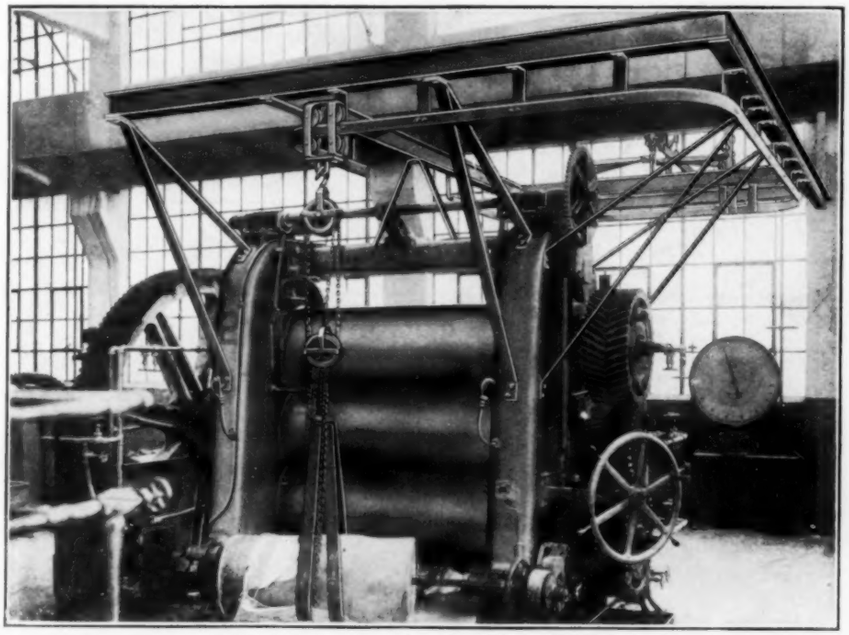

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It will also contain much matter that will be of service to *Crude Rubber Importers* and *Brokers, Manufacturers* and *Dealers* in *Chemicals* and *Compounding Ingredients, Manufacturers* of *Rubber Working Machinery, Fabric Manufacturers, Rubber Reclaimers, Consulting Chemists* and *Engineers, Waste Rubber Dealers* and *Rubber Planters.*

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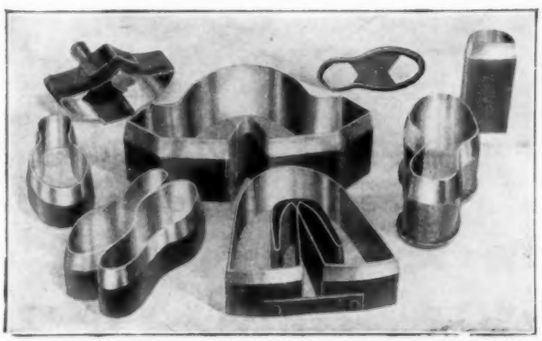

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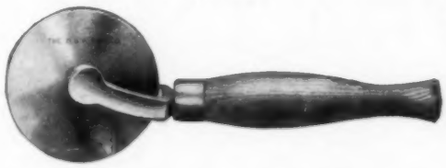

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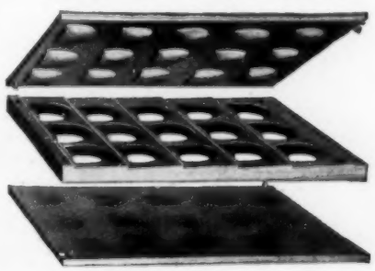

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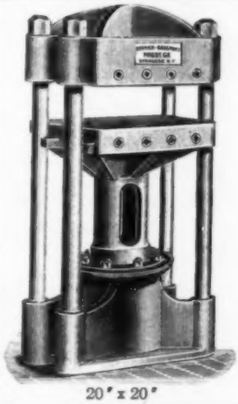

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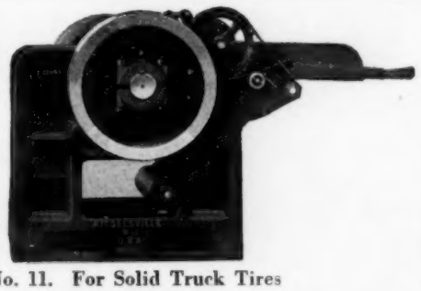

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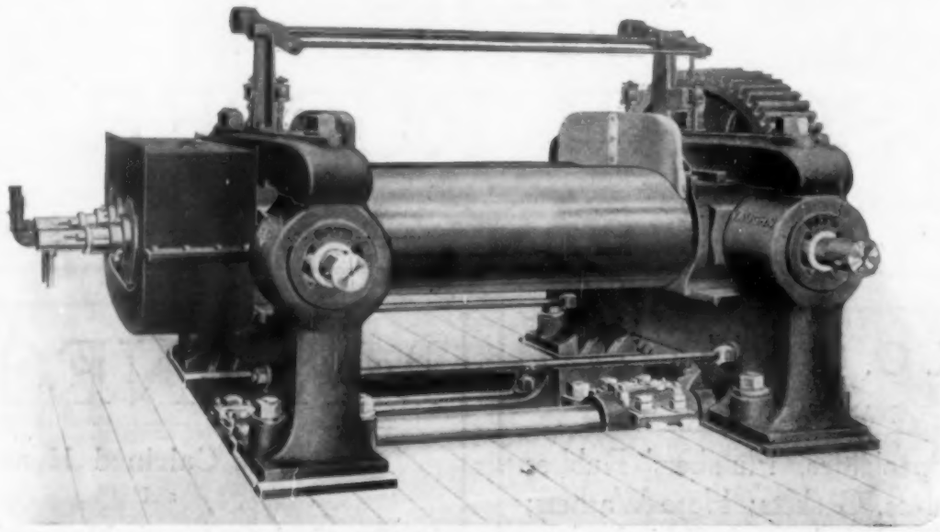

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